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A review of the small carrion beetle genus *Dissochaetus* Reitter (Coleoptera: Leiodidae; Cholevinae) in México

Sinopsis de las especies de pequeños coleópteros carroñeros del género *Dissochaetus* Reitter (Coleoptera: Leiodidae; Cholevinae) de México

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ABSTRACT

Descriptions, a key to species, and distribution maps are presented for the 18 species of *Dissochaetus* Reitter, 1884 known from Mexico. Twelve new species are described from Mexico and these are: *D. acanthus* Peck and Cook from Puebla and Veracruz states; *D. angustiformis* Peck and Cook from Oaxaca and Guerrero states; *D. bifurcus* Peck and Cook from Hidalgo, Chiapas, Puebla and San Luis Potosi states; *D. brevis* Peck and Cook from Durango, Estado de Mexico, Morelos, and Oaxaca states; *D. chiapensis* Peck and Cook from Chiapas State; *D. claviformis* Peck and Cook from Chiapas, Guerrero, Hidalgo, Jalisco, Morelos, Oaxaca, Puebla, Queretaro, San Luis Potosi, Sinaloa, Tamaulipas, and Veracruz states; *D. cristobalensis* Peck and Cook from Chiapas State; *D. lobatus* Peck and Cook from Durango, Hidalgo, Nuevo Leon, Oaxaca, Queretaro, and San Luis Potosi states; *D. newtoni* Peck and Cook from Chiapas, Oaxaca, and Veracruz states; *D. ocozocoautla* Peck and Cook from Chiapas State; *D. reniformis* Peck and Cook from Chiapas State; *D. sinuosus* Peck and Cook from Chiapas, Hidalgo, Jalisco, Estado de Mexico, Nuevo Leon, Oaxaca, Puebla, Queretaro, San Luis Potosi, Tamaulipas, and Veracruz states. *D. texanus* n. sp. Peck and Cook, formerly missidentified as *D. mexicanus* Jeannel, is described from Brewster County, Texas and may occur in adjacent Mexico. Additionally, *D. arizonensis* Hatch 1933 occurs in adjacent USA (Arizona, New Mexico, Texas) and should be expected in northern Mexico. All the species are carrion and dung scavengers in semi-arid to wet forests, from near sea-level to 3050 m in altitude, and some are troglophilic scavengers on bat guano in caves.

Key words: Leiodidae, Cholevinae, Anemadini, *Dissochaetus*, Mexico, carrion, dung, forest litter, caves.

RESUMEN

Se presentan descripciones, una clave para las especies y mapas de distribución para las 18 especies de *Dissochaetus* Reitter, 1884 conocidas de México. Se describen doce nuevas especies: *D. acanthus* Peck y Cook de Puebla y Veracruz; *D. angustiformis* Peck y Cook de Oaxaca y Guerrero; *D. bifurcus* Peck y Cook de Hidalgo, Chiapas, Puebla y San Luis Potosí; *D. brevis* Peck y Cook de Durango, Estado de México, Morelos y Oaxaca; *D. chiapensis* Peck y Cook de Chiapas; *D. claviformis* Peck y Cook de Chiapas, Guerrero, Hidalgo, Jalisco, Morelos, Oaxaca, Puebla, Queretaro, San Luis Potosi, Sinaloa, Tamaulipas y Veracruz; *D. newtoni* Peck y Cook de Chiapas, Oaxaca, y Veracruz; *D. ocozocoautla* Peck y Cook del Estado de Chiapas; *D. reniformis* Peck y Cook del Estado de Chiapas; *D. sinuosus* Peck y Cook de Chiapas, Hidalgo, Jalisco, Estado de México, Nuevo León, Oaxaca, Puebla, Querétaro, San Luis Potosí, Tamaulipas, y Veracruz. *D. texanus* Peck y Cook, anteriormente identificado como *D. mexicanus* Jeannel, se describe desde el condado de Brewster, Texas y puede ocurrir en el norte de México. Adicionalmente, *D. arizonensis* Hatch, 1933 ocurre en localidades de Estados Unidos cercanas a México en los estados de Arizona, Nuevo México y Texas; se debe esperar su presencia en el norte de México. Todas las especies son carroñeras y estercoleras en areas semiáridas hasta bosques húmedos, desde cerca del nivel del mar hasta 3,050 m de altitud; algunos son coprófagos troglofilos en guano de murciélagos en cuevas.

Palabras clave: Leiodidae, Cholevinae, Anemadini, *Dissochaetus*, México, carroña, estiércol, restos forestales, cuevas.

Dissochaetus Reitter 1884 (Coleoptera: Leiodidae; Cholevinae; Anemadini; Eunemadina) is a genus of mostly Neotropical carrion scavengers. Three species are reported from America north of Mexico (Peck 1999). From Mexico southward an additional 27 species were named as of 1998 (Peck et al. 1998). An additional 24 species have been described since then, mostly from South America (Peck, unpublished data) but with some species also in Central America and the West Indies (Peck and Cook 2014). The subtribe is restricted to the New World and contains another 10 genera and these are all restricted to southern South America (Chile and Argentina).

All species seem to be scavengers at carrion and dung, feeding on the micro-organisms of decay, in semi-arid to wet forested habitats from tropical lowlands to montane treeline. Specimens can be easily caught in carrion and dung baited pitfall traps, and the largest numbers of individuals are caught in forests at middle and upper elevations. The results of the present study show that the species have little affinity for particular forest types. Members of the genus are the most common of all small carrion feeding beetles caught at carrion in the Neotropics. The next most frequent habitat for the genus is in caves, on or near bat guano, often at the viscous and tarry semi-liquid guano pools of vampire bats (*Desmodus rotundus* Geoffroy). The purpose of this

paper is to summarize new knowledge of the 18 known species of these beetles in Mexico as part of a series of papers on the systematics of New World Leiodidae (Peck 2000).

The beetles are typical leiodids, with antennal segment 8 being smaller than segments 7 and 9. The well-developed occipital carina along the dorsal hind margin of the head places them in the Cholevinae. The transversely striolate elytra, contiguous mesocoxae, well developed and tubular male genital segment, and hind margin of the hind tibiae with a dorsal and ventral inner spur and four shorter outer spines place them in the tribe Anemadini (Fig. 1). They are separated from other members of the tribe by the serrate margins of the inner apical metatibial spurs, which are usually more than half the length of the first metatarsomere. The known larvae have a dorsal-medial lightly coloured spot on the head and paired thoracic and abdominal (glandular?) structures which may be an autapomorphy for the genus (Gnaspini 1993).

The six species previously reported from Mexico have been occasionally mentioned since their description. They are: *D. hetschkoi* Reiter, 1885; *D. obscurus* Portevin, 1903; *D. mexicanus* Jeannel, 1936; *D. aztecus* Szymczakowski, 1971; *D. navarretei* Gnaspini, 1999; and *D. costaricensis* Salgado-Costas, 2010. *D. mexicanus* was previously erroneously reported from Texas (Peck 1999), and is reported here as the new species *D. texanus* Peck and Cook and may be expected to occur in Mexico. Additionally, *D. arizonensis* Hatch of Arizona, New Mexico and other states can be expected to occur in Mexico in the states of Sonora and Chihuahua. Peck (1977: 186) reported in error *D. curtus* Portevin, 1903, from caves in Chiapas and Guerrero states. This species is presently known to actually occur only in Bolivia and Peru.

MATERIAL AND METHODS

Over 2,000 specimens were examined from the following collections and curators or collectors.

AFNC Alfred F. Newton, Jr., private collection; later placed in SBPC collection. A.F. Newton.

CMNC Canadian Museum of Nature collection, Research and collections Division, Ottawa, ON K1P 6P4, Canada (R. S. Anderson and F. Génier)

CNCI Canadian National Collection of Insects, Agriculture Canada, Ottawa, Ontario, Canada (A. Smetana, A. Davies)

FMNH Field Museum of Natural History, Chicago, Illinois, U. S. A. (A. F. Newton)

MNHN Muséum National d'Histoire Naturelle, Paris, France (A. Taghavian and Th. Deuve)

SBPC Stewart B. Peck Collection, Ottawa, Ontario, Canada (later to be placed in CMNC).

Supplementary identified specimens are placed in FMNH, CNCI, Museum of Comparative Zoology (MCZC, Harvard University, Cambridge, MA), and Florida State Collection of Arthropods (FSCA, Gainesville, FL).

Types of only some previously described species were available for study. We believe most were adequately described or illustrated for accurate identification.

For holotype, paratype, and all other specimens we report label data as they appear on the specimen labels, including collectors' field codes (for possible reference to their field notes). We have not edited or altered this data for uniformity or accuracy, but have quoted it as on the labels to aid in recognition of specimens seen by us. Where we believe there are errors on the label we follow that with the correction in brackets […]. We have not converted miles into kilometres, or elevation given in feet to meters, so as to preserve the original data on labels.

To confirm identification to species it is necessary to examine the aedeagus and genital segment of male specimens. Females are difficult to place with confidence to species, unless collected with associated males. Many samples contain more than one species in the genus so simple association with males may be unreliable. Male specimens were dissected after being relaxed and removed from points or a card. Relaxing was accomplished by immersion for one day in a commercial household ammonia-based window cleaning solution. The specimen was then dissected in alcohol. The aedeagus was examined, dehydrated in alcohol, and placed in Euparal mounting medium on a small acetate-plastic micro slide. External characters were examined with a stereomicroscope from 10X to 200X magnification. Structures for illustration were photographed with a digital camera mounted on a stereomicroscope. Details were observed with a compound microscope and then added to outline illustrations made from the digital photographs. Illustrations of the aedeagus include features of the armature of the internal sac.

We have used the criteria of priority and alphabetical order to arrange the taxa in this paper. It is not possible at this time to attempt a phylogenetic understanding of the relationships for all the species in the genus considered here due to the lack of a comprehensive study of the species from outside the region under study.

Jeannel (1936) and Salgado-Costas (2010b) have proposed systems of species groups for this large genus. We have not been able to satisfactorily place some of our species into these groups, so do not use them at this time.

The vast majority of the specimens were collected during intensive sampling programs in eastern, central and southern Mexico by A. F. Newton in 1970 (12 July to 13 August), 1971 (25 May to 1 October), and 1973 (22 June to 30 September) and S. B. Peck in 1969 (18 June to 13 September), 1971 (15 May to 22 June), and 1983 (1 June to 23 August). Northwestern Mexico is still in need of sampling. Specimens were mostly caught at traps baited with carrion (often Cs, meaning carrion of rotting squid) or dung (often Dh, meaning human dung).

Of great use for locating possible field sites in Mexico were Ball (1973), Ball and Whitehead (1967), Howden (1966), and Miranda and Sharp (1950). Of immense help in understanding the vegetational zones and biogeography of Mexico were the classic papers of Beard (1944, 1955), Gómez-Pompa (1973), Halffter (1987), Leopold (1950), Martin and Harrell (1957), Miranda and Sharp (1950), and Rzedowski (1978). Results show that the species show little specific affinity to vegetation types, as might be expected for generalist scavengers.

The distribution maps were prepared with use of " Caminos de Mexico" (Alcorta Guerrero, 1967). The names of the states of Mexico are shown in Figure 2.

As have others before us (e. g.; Anderson and O'Brien

1996: 344; Ball and Roughley 1982: 316**;** Ball and Shpeley 2000: 365) we are saddened that some of the lowland and middle elevation moist forest sites sampled for this study no longer exist. We believe that the full richness of the biological wealth of the nation of Mexico can only be fostered by the preservation of its habitats and self-sustaining biological systems and all the organisms included within them.

RESULTS
SYSTEMATICS

Dissochaetus Reitter

Dissochaetus Reitter, 1885 [1884]: 39. Type species: *Dissochaetus hetschkoi* Reitter, 1885 [1884]. Jeannel 1922: 41; 1936: 142; Hatch 1928: 163. *Dissochaetus* Portevin, 1902: 513 (as new, for "*Dissochaetus* Reitter *in litt."*); 1903: 156 (as new). Type species: *Catops spinipes* Murray, 1856 (monotypy). Note: Portevin (1907: 67) recognized Reitter's generic authorship.

Diagnosis. Length 1.8–3.5 mm. Shape elongate-oval, moderately convex. Pubescent. Pronotum finely, densely granulate. Elytra transversely striolate with strioles usually about perpendicular to suture; transverse lines of microsculpture between strioles.

Head. Epistomal suture absent. Eyes well developed. Apical maxillary palpomere conical, acuminate, about as long as penultimate palpomere. Antennae robust, extending to or slightly beyond base of pronotum. Antennomeres 1–3 elongate, usually about equal in length; 4–6 shorter; 7–11 form a rather loose club, with 8 reduced.

Thorax. Pronotum transverse, usually with evenly curved sides; posterior angles usually obtuse. Elytra tapering posteriorly, sides weakly rounded, apices separately evenly rounded; with sutural striae. Fully winged. Mesosternum with median carina. Legs slender. Mesotibiae slightly curved, metatibiae straight. Mesotarsi and metatarsi each with four apical spines, two external ones short, two internal ones long; dorsal internal spine usually as long as or longer than first tarsomere, finely serrate. Male protarsomeres 1–3 more or less dilated; female protarsomeres and mesotarsomeres of both sexes simple.

Abdomen. Sternites 3–7 visible in both sexes; sternite 8 usually partly retracted. Aedeagus elongate, broad, flattened, more or less arched; median lobe narrowed apically, often with one or more pairs of lateral setae; basal lamina usually about as long as median lobe. Internal sac with patches of spines, often with paired sclerotized structures; flagellum usually short, with basal bulb. Parameres elongate, flattened, often twisted or explanate apically, each bearing a pair of setae apically. Male genital segment as long as or longer than wide, consisting of dorsal tergite and pair of pleurites that meet midventrally; pleurites apically with lateral and ventral lobes; sternite reduced to small sclerite or absent. Spermatheca of two ovoid or spherical capsules joined by a short duct; basal capsule usually larger; apparently without sufficient characters to be useful in species identification.

Distribution. Nearctic, Neotropical.

Bionomics. Carrion and dung scavengers in forests and caves.

Key to males of *Dissochaetus* species of Mexico

1. Smaller species, total length usually less than 2.5 mm; sternite present in male genital segment (Fig. 4, 15, 26, 31, 33) and/or paramere apices strongly expanded (Fig. 5, 16, 25, 32) 2
-- Larger species, total length usually greater than 2.5 mm; sternite absent in male genital segment; paramere apices not strongly expanded 7
2. Parameres apically with broad flange on inner margins (Fig. 5, 32) 3
-- Parameres otherwise 4
3. Ventral lobes of pleurites of male genital segment broadly triangular (Fig. 31) ..... *D. newtoni* Peck and Cook, n.sp.
-- Ventral lobes of pleurites of male genital segment elongate, narrow (Fig. 6) ..... *D. obscurus* Portevin
4. Apex of each paramere with elongate, curved spine (Fig. 16) ..... *D. acanthus* Peck and Cook, n.sp.
-- Apices of parameres without elongate spines 5
5. Apices of parameres with small, toothlike structure on inner margins (Fig. 3, 25); ventral lobes of pleurites of male genital segment narrow (Fig. 4, 26) 6
-- Apices of parameres unarmed (Fig. 34); ventral section of pleurites of male genital segment bilobed: outer lobes elongate, inner lobes triangular (Fig.33) .... *D. ocozocoautla* Peck and Cook, n.sp.
6. Small species (length 2.4 mm or less); widespread; apex of median lobe drawn out, slender (Fig. 3); sternite of male genital segment broad, with many setae (Fig. 4) .... *D. hetschkoi* Reitter
-- Larger species (length 2.4 mm or more); known only from Mexican state of Chiapas; apex of median lobe less drawn out (Fig. 25); sternite of male genital segment narrowing apically, bearing one pair of long setae (Fig. 26) .... *D. chiapensis* Peck and Cook, n.sp.
7. Parameres short, not extending beyond apex of median lobe of aedeagus (Fig. 21) .... *D. brevis* Peck and Cook, n.sp.
-- Parameres extending beyond apex of median lobe 8
8. Inverted internal sac of aedeagus without paired dark sclerites basally 9
-- Inverted internal sac of aedeagus with pair of dark sclerites basally (e.g. Fig. 8, 10) 12
9. Apex of median lobe of aedeagus broadly rounded (Fig. 13) ..... *D. costaricensis* Salgado-Costas
-- Apex of median lobe of aedeagus narrower 10
10. Apex of median lobe of aedeagus with one pair of lateral setae (Fig. 20); large metatibial spur longer than first tarsomere; known from southern states of Mexico (Fig. 48) ..... *D. bifurcus* Peck and Cook, n.sp.
-- Apex of median lobe of aedeagus with two pairs of lateral setae (Fig. 39); large metatibial spur shorter than first tarsomere; known from SW United States (may occur in northern Mexico) 11
11. Apex of median lobe of aedeagus evenly narrowed, not lobed (Peck 1999; Fig. 3–5); widespread in southern Rocky Mountains of U.S.A. ..... *D. arizonensis* Hatch
-- Apex of median lobe of aedeagus strongly lobed (Fig. 39); known from west Texas .... *D. texanus* Peck and Cook, n.sp.
12. Median lobe of aedeagus triangular, about one-half length of basal lamina (Fig. 11); parameres elongate, broad in dorsal view (Fig. 11) ..... *D. navarretei* Gnaspini

-- Median lobe of aedeagus narrowing apically; parameres more slender 13
13. Median lobe of aedeagus with distinct apical lobe 14
-- Median lobe of aedeagus not distinctly lobed at apex .. 15
14. Median lobe of aedeagus longer, with two pairs of lateral setae (Fig. 27); paired dark sclerites of inverted internal sac widest at base (Fig.27) .... *D. cristobalensis* Peck and Cook, n.sp.
-- Median lobe of aedeagus shorter, with one pair of lateral setae (Fig. 29); paired dark sclerites of inverted internal sac widest apically (Fig. 29) ... *D. lobatus* Peck and Cook, n.sp.
15. Median lobe of aedeagus broad, evenly narrowed to rounded apex (Fig. 35); parameres straight in dorsal view (Fig. 35); dark basal sclerites of inverted internal sac small, reniform (Fig. 35) ..... *D. reniformis* Peck and Cook, n.sp.
-- Apex of median lobe narrow, or internal sac with two pairs of elongate sclerites 16
16. Parameres narrow (Fig. 10, 37); median lobe of aedeagus with two pairs of lateral setae 17
-- Parameres broad in dorsal view (Fig. 8, 18, 23); median lobe of aedeagus with one pair of lateral setae 18
17. Inner margins of ventral lobes of pleurites of male genital segment densely setose (Fig. 9); parameres usually outwardly curved apically, not sinuate (Fig. 10); inverted internal sac of aedeagus medially with pair of curved sclerites joined apically, often appearing as an inverted U-shape (Fig. 10) ..... *D. aztecus* Szymczakowski
-- Inner margin of ventral lobes of pleurites of male genital segment less densely setose (Fig. 38); parameres weakly sinuate (Fig. 37); inverted internal sac of aedeagus without medial pair of sclerites (Fig. 37) .... *D. sinuosus* Peck and Cook n.sp.
18. Median lobe of aedeagus strongly narrowed (Fig. 18); parameres not strongly widened before apex (Fig. 18) ..... *D. angustiformis* Peck and Cook, n.sp.
-- Median lobe of aedeagus wider (Fig. 8, 23); parameres widened before apex (Fig. 8, 23) 19
19. Median lobe of aedeagus shorter (Fig. 23); apical pair of sclerites of inverted internal sac with outwardly angled apices (Fig. 23); male genital segment shorter with rounded sides (Fig. 24) ..... *D. claviformis* Peck and Cook, n.sp.
-- Median lobe of aedeagus longer (Fig. 8); apical pair of sclerites of inverted internal sac less well developed (Fig. 8); male genital segment longer with concave sides (Fig. 7) ..... *D. mexicanus* Jeannel

Dissochaetus hetschkoi Reitter, 1885
Fig. 3, 4, 41

Dissochaetus hetschkoi Reitter, 1885 [1884]: 39; Portevin, 1903: 161 (as new, "Reitt. in litt."); Jeannel, 1936: 153; Szymczakowski, 1961: 157; 1963: 680; 1969: 412; Peck, 1973: 104; 1977: 189; Peck et al, 1998: 56; Gnaspini, 1991: 332; Salgado-Costas, 1991: 214; 1999: 37; 2010a: 294; 2010b: 150; 2011: 426. Holotype in MNHN, not seen. Type locality: Blumenau, Santa Catarina State, Brazil.

Diagnosis of male. Total length 1.8–2.4 mm; greatest width 0.9–1.2 mm. Color medium brown to dark brown; head darker; mouthparts, basal antennomeres, apex of antennomere 11 paler. Weakly shining. Vestiture yellowish. Head punctate, punctures separated by about one diameter. Antennae reaching base of elytra; antennomere 4 about one-half length of 3; 6 distinctly shorter than 4 and 5; 7 slightly longer than 9 and 10; 7, 9 and 10 transversely symmetrical. Pronotum widest at basal two-fifths. First protarsomere as wide as protibial apex. Large metatibial spur extending well beyond first metatarsomere. Median lobe of aedeagus (Fig. 3) elongate, broad; apex drawn out, narrow, with one pair of lateral setae. Inverted internal sac with paired, irregularly shaped sclerites; patches of small spines apically; flagellum short. Parameres elongate, narrow, inwardly curved apically; apices each with a small toothlike process. Genital segment (Fig. 4) slightly longer than wide; apex of tergite shallowly emarginate, with a few setae; lateral lobes of pleurites rounded apically, with apical setae; ventral lobes of pleurites narrow, inwardly curved, with apical setae; sternite present, short and broad, bearing many setae apically.

This species is most easily identified by the combination of small size, narrow and drawn out apex of median lobe of aedeagus, and the presence of broad, short sternite of male genital segment. Salgado (2010b) places this species in the *spinipes* species group.

Material examined. MEXICO: CAMPECHE: Chicanna, 10 km W Xpujil, 12–14.VII.83, 300 m, S. & J. Peck, trop. seas. for. car. tps. (3, SBPC); Escarcega (6 km W), El Tormento, 12–23.VII.83, FIT, S. & J. Peck, 110 m, evergreen trop. for. (1, SBPC); 53 mi E Escarcega, 500', km 87.5, 8–14.VIII.71, A. Newton, 336 Dh (1, SBPC); 87 mi E Escarcega, km 143.5, 800', 8–14.VIII.71, A. Newton, 337 Dh (4, SBPC). CHIAPAS: 4 mi S Palenque, 600' , 7–15.VIII.71, A. Newton, 325 Dh (17, SBPC); same data except: 600', rainforest, 326 Dh (10, SBPC); same data except: 700', 327 Dh (10, SBPC); 6 mi S Palenque, 700', rainforest, 7–15, VIII.1971, A. Newton, 328 Dh (10, SBPC); 6.5 mi S Palenque, 900', rainforest, 7–15.VIII.71, A. Newton, 329 Dh (8, SBPC); 7 mi S Palenque, 7–15. VIII.71, 1100', Newton, 330 Dh (10, SBPC); same data except: 331 Dh (2, SBPC); same data except: 332 Dh (8, SBPC); 3 mi S Palenque, 300', rainforest, 7–15.VIII.71, A. Newton, 333 Dh (7, SBPC); Palenque, 6–9.VII.83, 100 m, S. & J. Peck, rainforest, carrion traps (15, SBPC); Palenque, 2–30.VII.83, S. & J. Peck & R. Anderson, rainforest, FIT, 100 m (2, SBPC); 15 mi NW Ocozocoautla, 2800', 19–25. VIII.71, rainfor., A. Newton, 361 Dh (2, SBPC); 12 mi NW Ocozocoautla, 3400', 19–25.VIII.71, A. Newton, 362 Dh (4, SBPC); 11 mi NW Ocozocoautla , 3400', 19–25.VIII.71, oak-trop. evgrn. for, A. Newton. 363 Dh (4, SBPC); Lagunas Montebello P.N., 4900', 21–24.VIII.71, Newton, 348 Dh (1, SBPC); Lagunas Montebello, 4500', 14–17.VIII.69, moist for., S. & J. Peck, car. tp., 563-68 (1, SBPC); Ruinas de Palenque, 3 mi S Palenque, 7–15.VIII.71, 300', A. Newton, rainf. (5, SBPC). NUEVO LEÓN: 13 mi W Montemorelos, Chorros de Agua, 19–25.VI.1969, S. & J. Peck, dogfood bait traps, epigean, T476 (3, SBPC); Monterrey, Chipinque Mesa, 5400', 21–25.VI.1969, for. dung tps., 470–72, S. & J. Peck (3, SBPC); same data except: for. car., 473–4 (1, SBPC); 29 km W Linares, S Rosa Can., 3–5.VI.83, 700 m, oak & thorn for., S. & J. Peck, carrion traps (3, SBPC); 16 mi W Linares, 2800', 27–31.V.71, A. Newton, 225 Dh (2, SBPC). OAXACA: 10 km SSW Acatlan, Cueva del Lencho Virgen, 2–3.I.1974, J. Reddell, R. Jameson, D.

McKenzie, W. Elliott (3, SBPC); 9 mi N Valle Nacional, 100', 20.VII–1.VIII.71, trop. subevgn. for., A. Newton, 296 Dh (6, SBPC); same data except: 296 Cs (4, SBPC); 5 mi S Valle Nacional, 1600', 20.VII–1.VIII.71, A. Newton, 297 Dh (1, SBPC); same locality, 20–30.VII.71, sub-evrgn. for., A. Newton, 298 Dh (1, SBPC); 6 mi S Valle Nacional, 2000', 20–31.VII.71, trop. subevgn. for., A. Newton, 299 Dh (5, SBPC); same locality, 18–20.V.71, S. Peck, dung & carrion tr. (1, CNCI); 6 mi S Valle Nacional, 2200', 22–31. VII.71, A. Newton, 300 Dh (2, SBPC); 1 mi E Retorno, 12–16.VIII.1973, trop. evgn. for., 100', A. Newton, 518, carrion (5, SBPC); 2.4 mi S Valle Nacional, 700', 13–17. VIII.1973, evgn. oak for., A. Newton, 519 C (4, SBPC); 4.5 mi S Valle Nacional, trop. evgn. for., 1500', 13–16. VIII.1973, A. Newton, 521, carrion (1, SBPC). PUEBLA: 4 mi E Gilberto Camacho, 700', 3–8.VII.71, A. Newton, 274 Dh (2, SBPC). QUERÉTARO: 18 mi E Landa Matamoros, 5300', 28–30.VI.1973, A. Newton, 492 Cs (1, SBPC). QUINTANA ROO: Kohunlich, 68 km W Chetumal, 15–17.VII.82, S. & J. Peck, seasonal trop. for. litter, carrion traps (21, SBPC); 10 mi NE Bacalor [Bacalar], 100', km 36.25, 9–19.VIII.71, A. Newton, 339 Dh (8, SBPC); 15 mi NE Bacalar, 100', km 44, 9–14.VIII.71, A. Newton, 340 Dh (4, SBPC); 20 mi S Felipe Carillo Puerto, 100', km 99.75, trop. subevgrn. for., 9–13.VIII.71, A. Newton, 341 Dh (5, SBPC); 21 mi W Felipe Carillo Puerto, more than 100', trop. subevgn. for., 9–15.VIII.71, A. Newton, 342 Dh (10, SBPC). SAN LUIS POTOSI: Cueva del Agua, 8.5.66, J. Reddell, J. Fisk, D. McKenzie (1, SBPC); 3 mi W El Naranjo, 1100', Km 38, 10–18.VI.71, A. Newton, 233 Dh (11, SBPC); same data except: 1200', 234 (8, SBPC); same data except: 234 Dh (2, SBPC); Xilitla, 1800', km 265, 20–28.VI.71, A. Newton, 251 Dh (1, SBPC); 14 mi N Tamazunchale, 200', 22–28.VI.71, A. Newton, 253 Dh (1, SBPC); El Salto, 6–9.VII.1969, trop. decid. for., Dh, S. & J. Peck, 503–504 (2, SBPC). TABASCO: 46 mi SE Villahermosa, 150', Km 74, 8–15.VIII.71, A. Newton, 334 Dh (2, SBPC). TAMAULIPAS: 300m, Gomez Farias, 6.VI–7.VIII.83, S. & J. Peck, moist ravine trop. decid. for. FIT (19, SBPC); 29.VII.69, for., T487–88 [no other data] (1, SBPC); 6 mi NW Gomez Farias, Rancho del Cielo, 3700', 1–4.VII.69, cloud forest, S. & J. Peck, dng tps, 492–6 (1, SBPC); Gomez Farias, Rancho del Cielo, 3900', 1–4.VII.69, cloud forest, S. & J. Peck, car tps 499–501 (1, SBPC); 10 km W El Encino, 200 m, 18–20.VII.1980, O. Kukal, dung trap, lowland forest (2, SBPC). VERACRUZ: Atoyac, Cueva de Atoyac, 6–9.VIII.1969, S. & J. Peck, T555–6 (2, SBPC); 33 km NE Catemaco, 160 m, S. & J. Peck, Los Tuxtlas Biol. Sta., 1.VII–1.VIII.83, FIT, ridge rainforest (7, SBPC); same data except: ravine rainforest (3, SBPC); Cordoba, 4–6.VIII.1969, trop. evgn. for. car. tp, S. Peck, 543–44 (9, SBPC); 33 km N Catemaco, Los Tuxtlas Biology Stn., 13–20.VII.1984, D.H. Lindeman (3, SBPC); 8 mi NNW Sontecomapan, 1200', 29.VII–4.VIII.70, A. Newton, 137 Cs (2, SBPC); same data except: 29.VII–5. VIII.70, 300' (3, SBPC); 8 mi NNW Sontecomapan, 500', Univ. Biol. Sta. Forest, 29.VII–4.VIII.70, A. Newton, Dh (1, SBPC); same data except: 31.VII–4.VIII.1970, Cs (5, SBPC); same data except: 31.VII–7.VIII.1970, carrion (9, SBPC); same data except: 31.VII–5.VIII.1970, dung tp. (5, SBPC); same data except: 29.VII–4.VIII.1970, #3 dung tp (8, SBPC); same data except: 31.VII–4.VIII.1970, #5 dung tp (6, SBPC); same data except: Dh#7 (1, SBPC); same data except: 140 Dh (4, SBPC); same data except: 325 Dh (2, SBPC); same data except: 400' (1, SBPC); same data except: 3–5.VIII.71, 400', 325 Dh (4, SBPC); same locality, 200', 3–5.VIII.71, A. Newton, 323 Dh (3, SBPC); 5 mi S Sontecomapan, 1100', 2–5.VIII.71, A. Newton, 322 Dh (4, SBPC); Canyon Rio Metlac, nr. Fortin, 12–18.VII.71, A. Newton, 290 Dh (3, SBPC); same locality, 24.VII–1. VIII.73, trop. evgn. for., A. Newton, 511 Cs (3, SBPC); same locality, 13–18.VII.71, A. Newton, 295 Cs (3, SBPC); Fortin, Can. Rio Metlac, 3200', 511 Dh, 30.VII–1.VIII.73, evgn. for., A. Newton (1, SBPC); Catemaco, 15 mi S on 180, 1300', 28.VII–3.VIII.1970, Dh, A. Newton (4, SBPC); 8 mi E Catemaco, 1200', 29.VII–8.VIII.1970, trop. wet forest, A. Newton, Dh (7, SBPC); 6 mi NE Catemaco, 1700', 2–5. VII.71, A. Newton, 321 Dh (8, SBPC). YUCATAN: 9 mi SE Santa Rosa, 100', km 137, 9–13.VII.71, A. Newton, 343 Dh (3, SBPC); 14 km S Buenaventura, Cenote de San Luis, 2.IV.1973, J. Reddell (11, SBPC); 6 km S Buena Ventura, Cueva de Orizaba, 1.IV.1973, J. Reddell, D. & M. McKenzie, S. Murphy, M. Butterwick (7, SBPC); 1 km NE Tixcancal, Cenote Aka Chen, 2.IV.1973, J. Reddell, D. & M. McKenzie, S. Murphy, M. Butterwick (3, SBPC); 1 km W Sucopo, Cenote Sabacah, 31.III.1973, J. Reddell (6, SBPC); 20 m, 2 km E Chichenitza, 19–21.VII.83, S. & J. Peck, seas. for. car. tps. (10, SBPC); Cenote Jabin, 1.5 km W Kaua, (0350366, 2280759, WGS84), 5.VI.2003, J. Reddell, M. Reyes (2, SBPC); Actun Batab, 5 km N Santa Rita, (0381845, 2314537, WGS84), 26.XII.2002, J. Reddell, M. Reyes (1, SBPC); Cenote Xcoptiel, Xcoptiel, 4.5 km SSW Dzeal (WGS84: 346969, 2272309), 21.II.2007, J. Reddell, M. Reyes (1, SBPC).

Distribution. The species is widely distributed and reported from Argentina, Brazil, Belize, Costa Rica, Ecuador, Panama, Venezuela, and here from the Mexican states of Campeche, Chiapas, Nuevo Leon, Puebla, Queretaro, Quintana Roo, Tabasco, Tamaulipas, Veracruz, and Yucatan.

Bionomics. Recorded habitats in Mexico are tropical seasonal forest, evergreen forest, rainforest, oak-tropical evergreen forest, oak-thorn scrub, tropical sub-evergreen forest, cloud forest, and from a few caves. It is known from altitudes of 30 m to 1645 m.

Dissochaetus obscurus Portevin, 1903
Fig. 5, 6, 42

Dissochaetus obscurus Portevin, 1903: 162; Jeannel, 1936: 152; Peck et al, 1998: 57; Salgado-Costas, 2010b: 151. Type in MNHN. Type locality: Marcapata, Quichua, Peru.

Note on the "type": We have examined a specimen (MNHN) labelled "Pérou/ Marcapata"; "Jeannel/ vidit"; "Dissochaetus/ obscurus/ Port."; "type?". This specimen is in poor condition (missing genitalia, antennae, tibiae, and tarsi). We have used the detailed redescription and figures of Salgado-Costas (2010b) to determine our Mexican specimens.

Diagnosis of male. Total length 2.1–2.4 mm; greatest width 1.1–1.4 mm. Color medium brown to dark brown;

head darker; mouthparts, basal antennomeres, apical half of antennomere 11, and tarsi paler. Shining. Vestiture yellowish. Head punctate, punctures separated by about one diameter or less. Antennae reaching base of elytra; antennomere 4 slightly more than one-half length of 3; 6 shorter than 4 and 5; 7, 9 and 10 subequal in length, transversely symmetrical. Pronotum widest at basal one-fourth. First protarsomere not as wide as protibial apex. Large metatibial spur longer than first metatarsomere. Median lobe of aedeagus (Fig. 5) elongate, broad, narrowing and slightly down-turned apically; with two or more pairs of lateral setae. Inverted internal sac with paired, uniquely shaped sclerites and two rows of spines. Parameres elongate, twisted before broad apices, each with row of closely spaced fine setae on inner margins of expanded apices. Genital segment (Fig. 6) slightly longer than wide; apex of tergite emarginate, with pair of long apical setae and short subapical setae; lateral lobes of pleurite rounded apically, with apical setae; ventral lobes elongate, narrow, with apical setae; pleurites overlap slightly at midline; sternite absent.

This species is most easily identified by the combination of small size, elongate parameres twisted before expanded apices, each expanded paramere apex bearing a row of fine setae on inner margin, and narrow ventral lobes of pleurites of male genital segment. Salgado (2010b) places this species in the *spinipes* species group.

Material examined. MEXICO: CHIAPAS: 15 mi NW Ocozocoautla, 2800', 19–25.VIII.71, rainforest, A. Newton, 360 Dh (2, SBPC); same data except: 361 Dh (1, SBPC); 12 mi NW Ocozocoautla, 3400' , 19–25.VIII.71, A. Newton, 362 Dh (4, SBPC); 11 mi NW Ocozocoautla, 3400', 19–25.VIII.71, oak- trop. evgn. for., A. Newton, 363 Dh (3, SBPC); 11 mi NW Ocozocoautla, 3400', 19–25.VIII.71, A. Newton, 363 M (1, SBPC); 6.6 mi W El Bosque, 4800', 25–29.VIII.73, cloud forest, A. Newton, 542 (4, SBPC). HIDALGO: 2 mi NE Chapulhuacan, 2600', km 165.5, 22–29.VI.71, A. Newton, 254 Dh (5, SBPC); 4 mi SW Chapulhuacan, 3500', km 155.5, 22–29.VI.71, A. Newton, 255 Dh (2, SBPC); 6 mi SW Chapulhuacan, 3900', km 151, 23–29.VI.71, A. Newton, 256 Dh (1, SBPC); 4 mi SW Chapulhuacan, 3500', 27.VI–1.VII.73, fish, A. Newton, 493 (3, SBPC); 6.6 mi SW Chapulhuacan, 3900', 27.VI–1.VII.73, A. Newton, Cs 494 (5, SBPC). OAXACA: 13 mi S Valle Nacional, 3600', 9–12.VIII.1970, Dh, A. Newton (3, SBPC); same data and: S slope, forest, #1 (1, SBPC); 12 mi S Valle Nacional, 3000', 17–20.V.71, S. Peck, forest dung, T716–7 (1, SBPC); 6 mi S Valle Nacional, 2000', 18–20.V.71, S. Peck, forest dung, T718 (2, SBPC); 15 mi S Valle Nacional, 4000', 20–21.V.71, S. Peck, for. carrion, T723–4 (3, SBPC); same data except: forest dung, T725–6 (1, SBPC); 13 mi S Valle Nacional, 3600', 22–30.VII.1971, A. Newton, 143 Dh (8, SBPC); 7 mi S Valle Nacional, 2500', 22–31.VII.71, A. Newton, 301 Dh (5, SBPC); 5 mi S Valle Nacional, 3200', 22–31.VII.71, trop. subevgn. for., A. Newton, 302 Dh (10, SBPC); 15 mi S Valle Nacional, 4300', 20–31.VII.71, trop.subevgn. for., A. Newton, 303 Dh (2, SBPC); 13.3 mi S Valle Nacional, 3700', 12–15.VIII.73, trop evgn. for., A. Newton, 522 C (2, SBPC); 1220m, 26 km E Valle Nacional, 25.VI–2.VIII.83, km 71, S. & J. Peck, FIT, mont. trop. forest (5, SBPC); 6.6 mi W El Bosque, 4800', 25–28.VIII.73, forest, Newton, 542 (7, SBPC). PUEBLA: 4 mi NE Xicotepec de Juarez, 3900', 3–8.VII.71, A. Newton, 272 Dh (1, SBPC); 1.5 mi N Tlaxcalatonga [Tlaxcalantongo], 1800', 3–8.VII.71, A. Newton, 273 Dh (5, SBPC). SAN LUIS POTOSI: 5.6 mi E Xilitla, 17–19.VII.1969, trop. evgn. for., dung, 400 m, S. & J. Peck, 508–9 (1, SBPC). TAMAULIPAS: 300 m, Gomez Farias, 6.VI–7.VIII.83, S. & J. Peck, moist ravine, trop. decid. for., FIT (10, SBPC); 10 km W El Encino, 200 m, 18–20.VII.1980, O. Kukal, dung trap, lowland forest (1, SBPC). VERACRUZ: 4 mi N Huatusco, 4100', 11–16.VII.71, A. Newton (1, SBPC); 9 mi S Tlapacoyan, 3100', 9–14.VII.71, A. Newton, 271 Dh (2, SBPC); 8 mi S Tlapacoyan, 2700', 9–14.VII.71, A. Newton, 279 Dh (2, SBPC); 5 mi W Teocelo, 4300', 11–16.VII.71, A. Newton, 283 Cs (2, SBPC); 1.5 mi N Teocelo, 3700', 11–16.VII.71, A. Newton, 285 Dh (2, SBPC); 2 mi S Huatusco, 4100', 11–17.VII.71, A. Newton, 289 Dh (2, SBPC); Canyon Rio Metlac nr. Fortin, 12–18.VII.71, A. Newton, 290 Dh (3, SBPC); same locality, 13–18.VII.71, A. Newton, 295 Cs (5, SBPC); 1.7 mi N Teocelo, 3700', 22–24.VII.73, A. Newton, 510 Dh (1, SBPC); Canyon Rio Metlac nr. Fortin, 28.VII–1.VIII.73, trop. evgn. for., A. Newton, 511 Cs (1, SBPC); Canyon SW of Rio Metlac, 3200', 31.VIII.73, trop. subevergreen forest, A. Newton, 513 Cs (5, SBPC); 4.4 mi N Huatusco, 4200', 29.VII–2.VIII.73, cloud forest, A. Newton, 514 Dh (2, SBPC); same data except: 514 Cs (3, SBPC); 1.2 mi S Huatusco, 1344 m, 2–5.VIII.69, cloud for., S. & J. Peck, 541 Dh (1, SBPC); Canyon Rio Metlac, nr. Fortin, 5–8.VIII.69, trop. evgn. for., S. & J. Peck, dung, 548 (1, SBPC).

Distribution. The species was previously reported from the countries of Bolivia, Costa Rica, and Peru. The species is now known to occur in the Mexican states of Chiapas, Hidalgo, Oaxaca, Puebla, San Luis Potosi, Tamaulipas, and Veracruz.

Bionomics. The species is known from rainforest, oak-tropical evergreen forest, cloud forest, subtropical sub-evergreen forest, tropical montane forest, tropical evergreen forest, and tropical deciduous forest. It is known from altitudes of 300 m to 1463 m.

Dissochaetus arizonensis Hatch 1933

Dissochaetus arizonensis Hatch 1933: 197. Holotype in CASC (California Academy of Sciences, San Francisco), seen.

Type locality: Cave Creek, Chiricahua Mountains, 8000 feet, Cochise County, Arizona. Peck 1999: 182 (returning from *Echinocoleus* to *Dissochaetus*).

Echinocoleus arizonensis (Hatch), Jeannel 1936: 172.

Diagnosis of male. Total length 3.0–3.5 mm; greatest width 1.5–1.8 mm. Color dark reddish brown to black; black specimens completely black; paler specimens with darker head and pronotum. Weakly shining. Vestiture yellowish. Head densely punctate; punctures separated by less than one diameter. Antennae reaching base of elytra; antennomere 4 more than one-half length of 3; 6 shorter than 4 and 5; 7 longer than 9 and 10; 7, 9 and 10 transversely symmetrical. Pronotum widest at basal two-fifths. First protarsomere

barely as wide as protibial apex. Large metatibial spur slightly shorter than first metatarsomere. Median lobe of aedeagus (Peck 1999: 181, Fig. 3–5) broad, narrowing in apical third to narrow, rounded, slightly down-turned apex bearing two pairs of lateral setae. Inverted internal sac with patches of spines of various sizes; flagellum narrow, inserted in basal bulb. Parameres straight, narrow, extending beyond apex of median lobe. Genital segment (Peck 1999: 181, Fig. 6) narrowing apically, longer than wide; apex of tergite weakly rounded, sparsely setose; lateral lobes of pleurites rounded, sparsely setose; ventral lobes of pleurites triangular apically, more densely setose; sternite absent.

D. arizonensis somewhat resembles *D. sinuosus* n.sp. but lacks the pair of dark sclerotized structures of the internal sac of that species. It can be separated from *D. texanus* n.sp. by the absence of the lobed apex of the median lobe of the aedeagus of that species. Salgado (2010b) places this species in the *arizonensis* species group.

Distribution. Known from the United States, in the states of Arizona, New Mexico, Wyoming, Colorado, and Texas. This species should be expected in northwestern Mexico, in the states of Sonora and Chihuahua.

Bionomics. Known from coniferous and hardwood forests (such as oak woodlands, spruce-fir forests, aspen-maple forests, pine-oak forests, aspen and poplar forests, piñon-juniper woodlands, and riparian forest). Most specimens are taken in baited traps or at carrion.

Dissochaetus mexicanus Jeannel, 1936
Fig. 7, 8, 43

Dissochaetus mexicanus Jeannel, 1936: 152; Szymczakowski, 1968: 18; Peck, 1977: 186; 1999: 184 (misidentification); Peck et al, 1998: 57; Salgado-Costas, 1999: 37. Type in MNHN, seen, missing aedeagus. Type locality: "Mexique [Mexico], dans les maisons", implying at least the state of Mexico if not the city.

Diagnosis of male. Total length 2.0–3.3 mm; greatest width 1.1–1.7 mm. Color brown, head darker; antennomeres 1–4 and apical half of 11, mouthparts and tarsi paler. Weakly shining. Vestiture pale. Head densely punctate; punctures separated by less than one diameter. Antennae reaching base of elytra; antennomere 4 about two-thirds length of 3; 6 distinctly shorter than 4 and 5; 7 longer than 9 and 10; 7, 9 and 10 transversely symmetrical. Pronotum widest at basal two-fifths. First protarsomere slightly wider than protibial apex. Large metatibial spur slightly longer than first metatarsomere. Median lobe of aedeagus (Fig. 8) elongate, drawn out to narrow apex, bearing one pair of lateral setae; apex strongly curved ventrally. Inverted internal sac with patches of small spines medially and apically; poorly defined pair of elongate sclerites medially; one pair of large, dark sclerites basally; flagellum short. Parameres extend beyond apex of median lobe, widened in apical half. Genital segment (Fig. 7) longer than wide, sides contracted at apical two-fifths; apical margin of tergite truncate, sparsely setose; lateral lobes of pleurites sparsely setose; ventral lobes of pleurites broadly rounded, bearing strong setae apically and laterally; sternite absent.

This species most closely resembles *D. claviformis*. It differs in the following characters: antennomeres 7, 9 and 10 transversely symmetrical (asymmetrical in *claviformis*); median lobe of aedeagus longer with drawn out, slender apex; parameres in dorsal view evenly widened in apical half; male genital segment narrower, sides contracted at apical two-fifths. Salgado (2110b) places this species in the *arizonensis* species group.

Type material examined. Type, male (MNHN) with labels: white label "Mexico-Stadt./ F. Borchmann/ vend. 25.X.1910"; small brownish square; red label "TYPE"; white label handwritten "mexicanus" and our label "examined by/ S. Peck &/ J. Cook, 2016".

Additional material examined. MEXICO: CHIAPAS: 7 mi S Palenque, 1100', 7–15.VIII.71, A. Newton, 331 Dh (1, SBPC); 5600', 20 mi N Bochil, 24.VIII.71, A. Newton, 357 (1, SBPC); 15 mi NW Ocozocoautla , 2800', 19–25.VIII.71, rainforest, A. Newton, 360 Dh (1, SBPC); 12 mi NW Ocozocoautla , 3400', 19–25.VIII.72, A. Newton, 362 Dh (1, SBPC); 1 mi S Rizo de Oro, km 24, 2700', 20–26.VIII.71, A. Newton, 366 (2, SBPC); 6.6 miW El Bosque, 4800', 25–29.VIII.73, cloud forest, A. Newton, 542 (3, SBPC); Sumidero, 1000m, 1–13.VI.1990, Howden and Gill (2, SBPC); Pq. Nac. Sumidero, 1000 m, 29.VI.1990, H. & A. Howden (3, SBPC); 3 km SE Tuxtla Gutierrez, Cueva Cerro Hueco, 18.VIII.67, J. Reddell, J. Fish, M. Tandy (1, SBPC). GUERRERO: 9 mi NE Iguala, 4400', microondas, Tuxpan rd., 29.VIII–4.IX.71, A. Newton, 378 Dh (5, SBPC); 6 mi N El Ocotito, km 40.5, 2900', 30.VIII–5.IX.71, A. Newton, 380 Dh (1, SBPC); 7.5 mi N El Ocotito, 3100', 5.IX.71, A. Newton, 381 (1, SBPC); same locality, km 39, 30.VIII–3.IX.71, A. Newton, 381 Dh (1, SBPC); 1.5 mi N E. Ocotito, 3200', km 34, 30.VIII–5.IX.71, A. Newton, 382 Dh (9, SBPC). HIDALGO: 2 mi NE Chapulhuacan, 2600', 22–29.VI.71, A. Newton, 254 Dh (3, SBPC); 4 mi SW Chapulhuacan, 3500', km 155, 22–29.VI.71, A. Newton, 255 Dh (1, SBPC); same data except: km 155.5, 2255 Dh (1, SBPC); 6 mi SW Chapulhuacan, 3900', km 151, 23–29.VI.71, A. Newton, 256 Dh (1, SBPC); 10 mi NE Rancho Viejo, 5100', km 131, 23–29.VI.71, A. Newton, 257 Dh (1, SBPC); 4 mi SW Chapulhuacan, 3500', 27.VI–1.VII.73, fish, A. Newton, 493 (3, SBPC); 6.6 mi SW Chapulhuacan, 3900', 27.VI–1.VII.1973, A. Newton, Cs, 494 (3, SBPC). JALISCO: 18 mi SW Autlan, 1800', km 184, 14–19.IX.71, A. Newton (1, SBPC); same data and: 419 Dh (1, SBPC); 9.5 mi SW Autlan, 4300', km 169, 12–20.IX.1971, subtrop. decid. for., Newton, 423 Cs (1, SBPC); 7 mi SW Autlan, 3600', 14–19.IX.71, A. Newton, 424 Dh (1, SBPC); 5.5 mi NE Autlan, 3300', 12–19.IX.71, A. Newton, 425 (4, SBPC). MORELOS: 7 mi E Cuernavaca, 6.VII.1975, Q.D. Wheeler (15, SBPC). OAXACA: 15 mi S Sola Vega, 6000', 30–31.V.71, S. Peck, xericwood traps (2, SBPC); 9 mi E El Cameron, 23.VIII–6.IX.73, 4200', oak-pine-trop. decid. for., A. Newton, 546 Dh (3, SBPC). PUEBLA: Nuevo Necaxa, 1200 m, 25–28.VII.69, *Platanus* for., S. Peck, car., 525 (3, SBPC); same data except: sycamore forest, malt syrup tps, 526–530 (1, SBPC); 3 mi S Xicotepec de Juarez, 4000', 3–8.VII.71, A. Newton, 271 Dh (2, SBPC); 4 mi NE Xicotepec de Juarez, 3900', 3–8.VII.71, A. Newton, 272 Dh (2, SBPC); 1.5 mi N

Tlaxcalantongo, 1800', 3–8.VII.71, A. Newton, 273 Dh (1, SBPC). QUERETARO: 11 mi W Jalpan, 4600', km 162.5, 21–27.VI.1971, A. Newton, 246 Dh (1, SBPC). SAN LUIS POTOSI: 3 mi N Xilitla, Tlamaya, Cueva de la Porra, 19.VII.1969, S. & J. Peck, vampire guano (6, SBPC, as *D. aztecus* Szymczakowski in Peck, 1973). Cueva del Agua, 8.5.66, J. Reddell, J. Fisk, D. McKenzie (1, SBPC, as *D. aztecus* Szymczakowski in Peck, 1973). SINALOA: 32 mi NE Concordia, 4700', km 223, 24–28.IX.71, A. Newton, 438 Dh (1, SBPC); 15 mi W El Palmito, 28.VII.64, H.F. Howden (1, CNCI). TAMAULIPAS: 1000 m, nr. Gomez Farias, Rancho del Cielo, 6.VI–7.VIII.83, FIT, S. & J. Peck, cloud for. (32, SBPC); same data except: 300 m, moist ravine, trop decid. for. (13, SBPC); 6 mi NW Gomez Farias, Rancho del Cielo, 3700', 1–4.VII.69, cloud forest, S. & J. Peck, dng tps, 492–6 (4, SBPC); same data except: 402 Dh (5, SBPC); same data except: 499–501, Car. (14, SBPC). VERACRUZ: Canyon, Rio Metlac, nr. Fortin, 5–8.VIII.69, trop. evgn. for., S. & J. Peck, dung, 548 (3, SBPC); 1.2 mi S Huatusco, 1344 m, 5–8.VIII.69, cloud forest, S. & J. Peck, car., 549–50 (1, SBPC); 9 mi S Tlapacoyan, 3100', 9–14. VIII.71, A. Newton, 271 Dh (2, SBPC); 8 mi S Tlapacoyan, 2700', 9–14.VII.71, A. Newton, 279 Dh (3, SBPC); 1.5 mi N Teocelo, 3700', 11–16.VII.71, A. Newton, 285 Dh (2, SBPC); Canyon Rio Metlac, nr. Fortin, 12–18.VII.71, A. Newton, 290 Dh (1, SBPC); same locality, 3200', 13–18. VII.71, 295 Cs (2, SBPC); 1.7 mi N Teocelo, 3700', 22–24. VII.73, A. Newton, 510 Dh (1, SBPC); Canyon Rio Metlac nr Fortin, 28.VII–1.VIII.73, trop. evgn. for., A. Newton, 511 Cs (2, SBPC); same data except 511 Dh (1, SBPC); canyon SW of Rio Metlac, 3200', 31.VIII.1973, trop. subevergreen forest, A. Newton, 513 Cs (5, SBPC); 4.4 mi N Huatusco, 4280', cloud forest, 29.VII–2.VII.71, A. Newton, 514 Cs (6, SBPC).

Distribution. Previously reported only from Mexico, and now known from the states of Chiapas, Guerrero, Hidalgo, Jalisco, Morelos, Oaxaca, Puebla, Queretaro, San Luis Potosi, Sinaloa, Tamaulipas, and Veracruz.

Bionomics. The species is known from rainforest, cloud forest, sub-tropical deciduous forest, xeric woodlands, sycamore (*Platanus*) forest, tropical sub-evergreen forest and a few caves. It is known from the altitudes of 300 m to 1828 m.

Dissochaetus aztecus Szymczakowski, 1971
Fig. 9, 10, 44

Dissochaetus aztecus Szymczakowski, 1971: 402; 1977: 186 (doubtful record based on one female); Peck et al, 1998: 56.

Holotype in MNHN, not seen. Type locality: Sierra de Durango, Durango State, Mexico. Note: Peck's (1973: 105) record is a misidentification – see *D. sinuosus* n. sp.

Diagnosis of male. Total length 2.5–3.0 mm; greatest width 1.3–1.6 mm. Color dark brown, head slightly darker; antennomeres 1, 2 and apex of 11, mouthparts, tarsi often paler. Weakly shining. Vestiture pale. Head densely punctate; punctures separated by one diameter or less. Antennae reaching base of elytra; antennomere 4 about two-thirds length of 3; 6 shorter than 4 and 5; 7, 9 and 10 subequal in length, transversely nearly symmetrical. Pronotum widest at basal fourth. First protarsomere as wide as protibial apex. Large metatibial spur about as long as first metatarsomere. Median lobe of aedeagus (Fig. 10) elongate, with long, tapered, ventrally curved apex bearing two pairs of lateral setae. Inverted internal sac apically with two pairs of patches of short, broad spines; medially with pair of curved sclerites meeting apically as well as a large patch of short, broad spines; basally with a pair of dark sclerites each subtended apically by a narrow patch of spines angled laterally; flagellum short. Note: in some individuals, structures of the internal sac are reduced in size. Parameres narrow, extending beyond apex of median lobe, weakly spatulate and usually outwardly curved apically. Genital segment (Fig. 9) longer than wide; apex of tergite usually truncate, bearing several setae; lateral lobes of pleurites rounded apically, with apical setae; ventral lobes of pleurites low, with dense setation on inner margin; sternite absent.

This species can be identified by the combination of dense setation of the inner margins of ventral lobes of pleurites of male genital segment; internal sac of aedeagus medially with pair of curved sclerites meeting apically; internal sac basally with pair of dark sclerites each subtended apically by a narrow patch of spines angled laterally; parameres extending beyond apex of median lobe, weakly spatulate and usually outwardly curved apically. Salgado (2010b) places this species in the *arizonensis* species group.

Material examined. MEXICO: DURANGO: 24 mi W La Ciudad, 2.VII.64, H.F. Howden (4, CNCI); 10 mi W El Salto, 9000', 11.VII.1964, J.E.H. Martin (6, CNCI); same data except: 15.VII.1964 (2, CNCI); same data except: 29.VII.1964 (3, CNCI); 3 mi E El Salto, 8400', 25.VI.1964, L.A. Kelton (1, CNCI); 10 mi W El Salto, 26.VI.1964, H.F. Howden (2, CNCI); 42 mi W El Salto, 15.VI.1964, E.E. Lindquist (1, CNCI); 4 mi W El Salto, 9000', 14–17.VI.71, for. carrion, S. Peck, T772-3 (6, SBPC); same locality, 14–17.VII.1971, pine forest, cr. tp 772-73 (12, SBPC); same locality, 15–17.VI.71, T771 (3, SBPC); same data except: forest dung, T771 (1, SBPC); same data except: dung & carrion tp. (1, CNCI); 11 mi W El Salto, 9000', 14–17. VI.71, S. Peck, for. carrion, T774 (5, SBPC); same locality and date, pine forest, S. Peck, T775 (1, SBPC); 41 mi SW Ciudad, 7500', 15–17.VI.71, for. carrion, S. Peck, T778 (1, SBPC); same data except: 778-9 (1, SBPC); 14.5 mi SW La Ciudad, 7800', km 168, 24–29.IX.71, A. Newton, 442 Dh (2, SBPC); 9 mi SE La Ciudad, Durango, 8600', 24–27.IX.71, A. Newton, 443 Dh (2, SBPC); 25 km W El Salto, 1.VIII.1987, B. Gill (2, SBPC). GUERRERO: 7 mi W Mazatlan, 6700', Microondas station, 30.VIII–5.IX.71, A. Newton, 384 Dh (1, SBPC); 7.5 mi W Mazatlan, 7000', Microondas rd., 30.VIII–5.IX.71, A. Newton, 385 Dh (10, SBPC); 7.5 mi W Mazatlan, 7100', 30.VIII–5.IX.71, A. Newton, 386 Dh (3, SBPC); same data and: oak-madron-alnus for (10, SBPC). HIDALGO: 12 mi SW Jacala, 6200', 23–30.VI.71, A. Newton, 254 Dh (3, SBPC); same data except: 259 Dh (3, SBPC); 1 mi S El Chico, 8400', 1–6. VII.71, A. Newton, 260 Dh (5, SBPC); 2 mi S El Chico, 8800', 1–6.VII.71, A. Newton, 261 Dh (1, SBPC); 7 mi NE Pachuca (2 mi in on El Chico Rd.), 9300', 263 Dh, 1–6.VII.71, A. Newton (1, SBPC); 5.8 mi NE Pachuca,

9300', oak woodland, 5–12.VII.73, A. Newton, 343 Dh (5, SBPC); 1 mi S St. Monica, 6000', 7–12.VII.73, sweetgum for., A. Newton, 504 Dh (1, SBPC). JALISCO: 13 mi W Atenquique, 10–18.IX.71, 7900', A. Newton, 406 Dh (1, SBPC); same data except: 407 Dh (6, SBPC); same data except: 407 Cs (1, SBPC); 12 mi W Atenquique, 7500', 10–18.IX.71, A. Newton, 408 Dh (9, SBPC); 10 mi W Atenquique, 6700', 10–18.IX.71, A. Newton, 409 Dh (2, SBPC). 8 mi W Atenquique, 10–18.IX.1971, 5100', oak-pine-madrone woods, A. Newton, Dh 410 (10, SBPC); same data except: 9500', 410 Dh (4, SBPC); 7 mi W Atenquique, 5700', 10–18.IX.1971, A. Newton, 11 Dh (5, SBPC); 12 mi SW Cocula, 5800', 14–20.IX.71, A. Newton, 428 Dh (5, SBPC). ESTADO DE MEXICO: 1 mi E Ixtapan de la Sal, 31.VIII–6.IX.71, 6200', A. Newton, 391 Dh (7, SBPC); 5 mi SW Tenancingo, 7100', km 55, 31.VIII–6.IX.71, A. Newton, 392 Dh (2, SBPC); 4 mi SW Tenancingo, km 55.3, 7200', 31.VIII–6.IX.71, oak-pine, A. Newton, 393 Dh (8, SBPC); same data except: km 54, 9200' [7200'], 393 Dh (1, SBPC); 3 mi SW Tenancingo, 7100', 31.VIII–6.IX.71, A. Newton, 395 Dh (7, SBPC); 1 mi NE Tenancingo, 7100', km 44, 31.VIII–6.IX.71, A. Newton, 396 Dh (1, SBPC); 3 mi S Temascaltepec, 6600', 2–7.IX.71, A. Newton, 397 Dh (1, SBPC); 5 mi S Temascaltepec, 6500', 2–7.IX.1971, A. Newton, 398 Dh (3, SBPC); 3 mi NE Temascaltepec, 6300', km 63.25, 2–7.IX.71, A. Newton, 399 Dh (2, SBPC); 6 mi NE Temascaltepec, km 57.5, 7000', 2–7.IX.71, A. Newton, 400 Dh (1, SBPC); 7 mi NE Temascaltepec, 7000', 2–7. IX.71, A. Newton, 400 Dh (3, SBPC). MICHOACAN: 70 km E Morelia, Mil Cumbres, 8–10.IX.69, 9000', pine-oak, S. Peck, 612-4 (1, SBPC). MORELOS: 4 mi W Tres Cumbres, 9000', 29.VIII–4.IX.71, woodland, A. Newton, 374 Dh (1, SBPC). NUEVO LEON: 16 mi S jct Mex 60 & NL 61, 7600', 27–30.V.71, A. Newton, 228 Dh (1, SBPC); 18 mi S Jct Mex 60 & 68, km 29, 8000', 27–30.V.71, A. Newton, 229 Dh (19, SBPC); NE slope Cerro Potosi, 8200', 27–29.V.71, A. Newton, 231 Dh (2, SBPC); Galeana, Cerro Potosi, 10,500', 26–28.VI.69, pine forest, S. & J. Peck, 480-82 Dh (1, SBPC). OAXACA: 30 mi S Valle National, 6800', 23–29.VII.71, A. Newton, 308 Dh (1, SBPC); 14 mi S Ixtlan, 7500', 24–27.VII.71, A. Newton, 317 Dh (6, SBPC); 14 mi S Ixtlan Juarez, 7600', 10–18.VIII.73, oak woodland, A. Newton, 530 Dh (8, SBPC); 15.5 mi S Ixtlan Juarez, 7600', 10–18.VIII.73, oak woodland, A. Newton, 531 Dh (1, SBPC); 9 mi NE Oaxaca, km 10, rt. 175, 6200', 9–20.VIII.73, Alnus-Salix, A. Newton, 540 Dh (5, SBPC) 12 mi S Sola Vega, 6500', 27–31.V.71, S. Peck, oak for, traps 742 (2, SBPC); 3 mi N Suchixtepec, 9500', 4–6.VI.71, S. Peck, gopher burrows (1, SBPC). PUEBLA: 4.4 mi SW Huauchinango, 1700 m, 25–28.VII.69, ravine oak for., S. Peck, 521-522 (4, SBPC). QUERETARO: 5 mi SW Pinal de Amoles, 8500', 21–27.VI.71, A. Newton, 243 Dh (1, SBPC); same data except: 7400', pine-oak for., A. Newton, 244 Dh (15, SBPC). SINALOA: 36 mi NE Concordia, 6000', km 215.5, 24–28.IX.71, A. Newton, 432 Dh (1, SBPC); 38.5 mi NE Concordia, 6200', km 211.5, 24–29.IX.71, A. Newton, 440 Dh (3, SBPC). VERACRUZ: 5 mi E Las Vigas, 7600', Alnus woods, 19–22.VII.73, A. Newton, 509 Dh (2, SBPC); Ciudad Mendoza, rt. 150D, 27.VII–3.VIII.73, 6200', A. Newton, 515 Cs (2, SBPC); 13.5 mi W Cd. Mendoza, rt. 150D, 27.VII–3.VIII.73, pine-oak-*Alnus*, 7500', A. Newton, 516 Cs (6, SBPC).

Distribution. The species is known only from Mexico from the states of Durango, Guerrero, Hidalgo, Jalisco, Estado de Mexico, Michoacan, Morelos, Nuevo Leon, Oaxaca, Puebla, Queretaro, San Luis Potosi, Sinaloa, and Veracruz.

Bionomics. The species is reported from pine forest, oak-madrone-*Alnus* forest, oak woodland, sweetgum (*Liquidambar*) forest, oak-pine-madrone woods, oak pine forest, *Alnus*-*Salix* forest, *Alnus* woods, pine-oak *Alnus* forest, and burrows of pocket gophers (Rodentia Geomyidae). It is known from altitudes of 1554 m to 3200 m.

Dissochaetus navarretei Gnaspini, 1999
Fig. 11, 12, 45

Dissochaetus navarretei Gnaspini, 1999: 374; Peck et al, 1998: 57. Holotype in MZSP (Museo de Zoologia, Saõ Paulo, Brazil), not seen. Type locality: San José de los Laureles, Tlayacapan, Morelos, Mexico.

Diagnosis of male. Total length 2.9–3.5 mm; greatest width 1.5–1.8 mm. Color dark brown, head darker; apex of antennomere 11, mouthparts and tarsi paler. Weakly shining. Vestiture pale. Head densely punctate; punctures separated by less than one diameter. Antennae reaching base of elytra; antennomere 4 about two-thirds length of 3; 6 shorter than 4 and 5; 7 slightly longer and narrower than 9 and 10; 7, 9 and 10 transversely symmetrical. Pronotum widest at basal one-fifth. First protarsomere wider than apex of protibia. Large metatibial spur about as long as first metatarsomere. Median lobe of aedeagus (Fig. 11) short, broad, evenly narrowing to rounded apex; lateral setae absent. Inverted internal sac with medial biramous sclerite and two pairs of rows of spines; pair of basal sclerites with rounded, black outer margins; flagellum short. Parameres elongate, broad. Genital segment (Fig. 12) longer than wide, sides rounded, base drawn out; apex of tergite evenly rounded, setose; lateral lobes of pleurites setose; ventral lobes of pleurites short, triangular, with elongate setae; sternite absent.

This species is distinguished by the combination of short median lobe of aedeagus with broad, rounded apex; and elongate, broad parameres. Salgado (2010b) places this species into the *granadensis* species group.

Material examined. MEXICO: HIDALGO: 12 mi SW Jacala, 6200', 23–30.VI.71, A. Newton, 254 Dh (1, SBPC); same data except: 259 Dh (2, SBPC). JALISCO: 8 mi W Atenquique, 9500', 10–18.IX.71, pine-oak-madrone, A. Newton, 410 Dh (1, SBPC); same data except: 5100' (1, SBPC); 6 mi W Atenquique, 5500', 10–18.IX.71, A. Newton, 412 Dh (1, SBPC); 12 mi W Atenquique, 7500', 10–18.IX.71, A. Newton, 408 Dh (1, SBPC). MEXICO: 3 mi SW Tenancingo, 7100', 31.VIII–6.IX.71, A. Newton, 395 Dh (1. SBPC); 3 mi NE Temascaltepec, 6300', km 63.25, 2–7.IX.71, A. Newton, 399 Dh (1, SBPC); 7 mi NE Temascaltepec, 7000', 2–7.IX.71, A. Newton, 400 Dh (1, SBPC). MORELOS: 8 mi S Tres Cumbres, 7400', km 65, 29.VIII–4.IX.71, A. Newton, 377 Dh (1, SBPC). OAXACA: 20 mi S Juchatengo, 6000', 27–30.V.1971, for. dung trap, S. Peck, T744–49 (1, SBPC); 3 mi N

Suchixtepec, 9500', 4–6.IV.71, S. Peck, for. dung, T768–9 (1, SBPC); 3.5 mi S Suchixtepec, 7000', 2–4.VI.71, S. Peck, dung & carrion tp. (1, CNCI); 14.2 mi S Ixtlan Juarez, 7600', 10–18.VIII.73, oak wood land, A. Newton, 530 Dh (1, SBPC); 9 mi NE Oaxaca, km 10, rte 175, 6200', 9–20.VIII.73, *Alnus, Salix*, A. Newton, 540 Dh (1, SBPC). QUERETARO: 19 mi E Landa de Maramoros, 5400', km 231, 12–27.VI.71, A. Newton, 249 Dh (1, SBPC). SAN LUIS POTOSI: 1700m, 40 km W Xilitla, 12.VI–6.VIII.83, S. & J. Peck, FIT, pine-oak forest (4, SBPC). VERACRUZ: 13.5 mi W Cd. Mendoza, rt 150D, 27.VII–3.VIII.73, pine-oak-*Alnus*, 7500', A. Newton, 516 Cs (2, SBPC); 8.2 mi W Ciudad Mendoza, rte 150D, 27.VII–3.VIII.73, oak wdld., 6200', A. Newton, 515 Cs (1, SBPC).

Distribution. The species is known only from Mexico, from the states of Hidalgo, Jalisco, Estado de Mexico, Morelos, Oaxaca, Queretaro, San Luis Potosi, and Veracruz.

Bionomics. Recorded habitats are pine-oak-madrone woodlands, oak woodlands, *Alnus*-*Salix* forest, and pine-oak forest from altitudes of 1554 m to 2895 m.

Dissochaetus costaricensis Salgado-Costas, 2010
Fig. 13, 14, 46

Dissochaetus costaricensis Salgado-Costas, 2010b: 159; 2011: 426. Holotype in INBIO (Instituto de Biodiversidad, San Jose, Costa Rica), not seen. Type locality: Estación La Casona, R.B. Monteverde, Puntarenas Province, Costa Rica.

Diagnosis of male. Total length 2.6–3.0 mm; greatest width 1.4–1.6 mm. Color brown; head, sutural striae and elytral apices darker; antennomeres 1–5 and 11, mouthparts, and tarsi paler. Moderately shining. Vestiture pale. Head densely punctate; punctures separated by about one diameter. Antennae reaching base of elytra; antennomere 4 about one-half length of 3; 6 shorter than 4 and 5; 7, 9 and 10 subequal in length, nearly transversely symmetrical. Pronotum widest at basal two-fifths. First protarsomere clearly wider than protibial apex. Large metatibial spur distinctly longer than first metatarsomere. Median lobe of aedeagus (Fig. 13) triangular with broadly rounded apex, bearing one pair of lateral setae; apex weakly curved ventrally. Inverted internal sac apically with pair of elongate patches of strong spines, subtended basad by a pair of small round structures, and with scattered small, short, broad spines; basally with median patch of small spines; flagellum short. Parameres elongate, outwardly curved apically, extending well beyond apex of median lobe. Genital segment (Fig. 14) longer than wide; apex of tergite truncate and bearing setae; lateral lobes of pleurites triangular, bearing a few setae; ventral lobes of pleurites triangular, bearing a row of strong setae on inner margins; sternite absent.

This species is distinguished by the following combination of characters: male first protarsomere clearly wider than protibial apex; large metatibial spur distinctly longer than first metatarsomere; apex of median lobe of aedeagus broadly rounded. Salgado (2010b) places this species into the *maculatus* species group.

Material examined. MEXICO: CHIAPAS: Lagunas, Montebello, 4500', 14–17.VIII.69, moist for., S. & J. Peck, car. tp., 563–68 (6, SBPC). HIDALGO: 6.4 mi S Tenango de Doria, 3000 m, 24–28.VII.69, S. & J. Peck, for. car., 510–11; Tlanchinol, 43 km SW Huejutla, 14.VI–4.VIII.83, 1500 m, cloud forest, S. Peck, 83-40 (4, SBPC); 2.5 mi N Tlanchinol, 5200', 8–11.VII.73, cloud for., A. Newton, 497 Dh (9, SBPC); same data except: 6–11.VII.73, 498 Dh (9, SBPC); same data except: 2.8 mi N Tlanchinol, 499 Dh (7, SBPC); 3.5 mi N Tlanchinol, 5100', 6–11.VII.73, cloud forest, A. Newton, 501 Dh (5, SBPC); 1 mi S St. Monica, 7–12.VII.73, 6000', liquid amber for., A. Newton, 504 Dh (1, SBPC); same data except: sweet gum for. (1, SBPC). OAXACA: 15 mi S Valle Nacional, 4000', 20–21.V.71, S. Peck, for. carrion, T723–4 (1, SBPC); same data except: forest dung, T725–6 (3, SBPC); 18 mi S Valle Nacional, 4800', 9–12.VIII.1970, Dh, ravine, A. Newton (1, SBPC); 13 mi S Valle Nacional, 3600', 22–30.VII.71, trop. subevgn. for., A. Newton, 143 Dh (1, SBPC); 23 mi S Valle Nacional, 5750', 9–12.VIII.70, cloud forest, A. Newton, 145 Dh (1, SBPC); 25 mi S Valle National, 6350', 23–30.VII.1971, Newton, 146 Cs (3, SBPC); 18 mi S Valle Nacional, 4800', 22–31.VII.71, trop. subevgn. for., A. Newton, 299 Dh (1, SBPC); same data except: 304 Dh (3, SBPC); 15 mi S Valle Nacional, 4300', 20–31.VII.71, trop. subevgn. for., A. Newton, 303 Dh (1, SBPC); 19 mi S Valle Nacional, 5100', 22–31.VII.71, cloud forest, A. Newton, 305 Dh (3, SBPC); 21 mi S Valle Nacional, 5400', 22–31.VII.71, A. Newton, 306 Dh (1, SBPC); 22.4 mi S Valle Nacional, 5600', 12–17.VIII.1973, cloud forest, A. Newton, 523C (5, SBPC); same data except: 523 Dh (1, SBPC). PUEBLA: 4.4 mi SW Huauchinango, ca 1700 m, moist ravine, Dt, oak for., 25–28.VII.1969, S. & J. Peck (1, SBPC); same data except: 519–20, dung trap (1, SBPC); same data except: 521–22 (3, SBPC); 5 mi W Huauchinango, 6000', 3–7.VIII.71, A. Newton, 269 Dh (1, SBPC); same data except: 5900', 3–7.VII.71, 270 Dh (3, SBPC); 4 mi E Teziutlan, km 59, 10–14.VII.71, 5000', A. Newton, 281 Dh (5, SBPC). QUERETARO: 25 mi E Landa de Matamoros, 14–17.VI.69, sweetgum forest, 5000', S. & J. Peck, T507 Dh (1, SBPC). SAN LUIS POTOSI: Xilitla area, Trinidad, 6500', 25.II–3.III.81, O. Kukal, carrion (1, SBPC); 20 km W Xilitla, 1600 m, FIT,12.VI–6.VIII.83, cloud for., S. & J. Peck, 83-37 (7, SBPC); Sotano Golondrinas, 24.XI.72, J. White (2, SBPC). TAMAULIPAS: 6 mi NW Gomez Farias, Rancho del Cielo, 3700', 1–4.VII.1969, S. & J. Peck, 402 Dh (1, SBPC); same data except: cloud forest, 492-6 (2, SBPC); same data except: car tps, 499–501 (8, SBPC); nr. Gomez Farias, Rancho del Cielo, 1000 m, 6.VI–7.VIII.83, FIT, S. & J. Peck, cloud for. (1, SBPC). VERACRUZ: 1.2 mi S Huatusco, 1344 m, 2–5.VIII.69, cloud for., S. & J. Peck, 541 Dh (1, SBPC); same data except: 5–8.VIII.69, car., 549–50 (1. SBPC); 14 mi S Tlapacoyan, 4000', 9–14.VII.71, A. Newton, 276 Dh (1, SBPC); 2 mi S Huatusco, 4100', 11–17.II.71, A. Newton, 289 Dh (2, SBPC); 4.4 mi N Huatusco, 4280', cloud forest, 29.VII–2.VIII.71, A. Newton, 514 Cs (1. SBPC).

Distribution. The species is also known from the countries of Costa Rica and Panama. It is now known to occur in the Mexican states of Chiapas, Hidalgo, Oaxaca, Puebla, Queretaro, San Luis Potosi, Tamaulipas, and Veracruz.

Bionomics. Recorded habitats are moist forest, cloud forest, sweetgum (*Liquidambar*) forest, tropical sub-evergreen forest, and oak forest and from altitudes of 304 m to 3000 m.

Dissochaetus acanthus Peck and Cook, n.sp.
Fig. 15, 16, 47
http://zoobank.org/93BB5BCA-EF85-40DF-9C2F-280885D186D8

Diagnostic description of male. Total length 2.1–2.3 mm; greatest width 1.1–1.2 mm. Color medium brown to dark brown; head darker; mouthparts, antennomeres 1–3 and 11, and tarsi paler. Weakly shining. Vestiture yellowish. Head finely punctate; punctures separated by one or more diameters. Antennae reaching base of elytra; antennomere 4 more than one-half length of 3; 6 distinctly shorter than 4 and 5; 7, 9 and 10 subequal in size, transversely symmetrical. Pronotum widest at basal one-fourth. First protarsomere narrower than protibial apex. Large metatibial spur slightly longer than first metatarsomere. Median lobe of aedeagus (Fig. 16) elongate, broad, with apex strongly drawn out, very narrow, with two pairs of closely spaced lateral setae. Inverted internal sac with paired sclerotized structures, large patches of spines apically; flagellum not seen. Parameres elongate, broad, with large membranous areas apically; each paramere apically with large, inwardly directed spine. Genital segment (Fig. 15) longer than wide; tergite narrowed apically with apical margin shallowly emarginate, setose; lateral lobes of pleurites low and rounded with a few apical setae; ventral lobes elongate, slender, parallel, with setae apically and on inner margin; sternite present, reduced to small median sclerite.

This species is most easily identified by the presence of elongate, curved spines on the paramere apices (Fig. 16).

Type material. Holotype, male, with the following label data: "MEX.[Mexico]: Pue.[Puebla]; Nuevo/ Necaxa, 1200 m/ 25–28.VII.69, *Platanus*/ for., S. Peck car. 525 " (SBPC). Paratypes (16): with same data as holotype (4, SBPC); MEXICO: PUEBLA: 3 mi S Xicotepec de Juarez, 4000', 3–8.VII.71, A. Newton, 271 Dh (4, SBPC); 1.5 mi N Tlaxcalantongo, 1800', 3–8.VII.71, A. Newton, 273 Dh (2, SBPC). VERACRUZ: 9 mi S Tlapacoyan, 3100', 9–14. VII.71, A. Newton, 271 Dh (1, SBPC); 8 mi S Tlapacoyan, 2700', 9–14.VII.71, A. Newton, 279 Dh (5, SBPC).

Distribution. Known only from the Mexican states of Puebla and Veracruz.

Bionomics. Recorded habitats are sycamore (*Platanus*) and mixed forests, at altitudes of 548 m to 1219 m.

Etymology. The epithet *acanthus* (Greek, spine) refers to the elongate spine on the paramere apices of this species.

Dissochaetus angustiformis Peck and Cook, n.sp.
Fig. 17, 18, 47
http://zoobank.org/FCA0776B-A7A1-4E3D-9315-E0173AD6AEE6

Diagnostic description of male. Total length 2.6–3.0 mm; greatest width 1.3–1.6 mm. Color dark brown, head darker; antennomeres 1, 2 and apex of 11, mouthparts and tarsi slightly paler. Weakly shining. Vestiture pale. Head densely punctate; punctures separated by less than one diameter. Antennae reaching base of elytra; antennomere 4 about two-thirds length of 3; 6 distinctly shorter than 4 and 5; 7 longer than 9 and 10; 7, 9 and 10 transversely symmetrical. Pronotum widest at basal two-fifths. First protarsomere barely as wide as protibial apex. Large metatibial spur about as long as first metatarsomere. Median lobe of aedeagus (Fig. 18) with apical one-third strongly narrowed; apex curved ventrally, indistinctly lobed, bearing one pair of lateral setae. Inverted internal sac with paired patches of small spines apically; larger, stronger spines medially; pair of curved, dark sclerites basally; flagellum short. Parameres elongate, moderately broad in dorsal view, extending well beyond apex of median lobe. Genital segment (Fig. 17) longer than wide, sides curved; apex of tergite rounded, bearing a few setae; lateral lobes of pleurites with lateral setae; ventral lobes of pleurites triangular, strongly setose laterally and medially; sternite absent.

This species is distinguished by the following combination of characters: apical third of median lobe of aedeagus strongly narrowed; inverted internal sac with strong spines medially and one pair of dark sclerites basally; parameres moderately broad in dorsal view, extending well beyond apex of median lobe.

Type material. Holotype, male, with the following label data: "MEX[ICO]: OAX[ACA]; 25 mi S/ Valle Nacional, 6350',/ 23-30.vii.1971/ A. Newton 146Cs" (SBPC). Paratypes (52): with same data as holotype (7, SBPC); same data except lacking "146Cs" (3, SBPC); 23 mi S Valle Nacional, 5750', 9–12.VIII.70, cloud forest, A. Newton, 145 Dh (1, SBPC); 24 mi S Valle Nacional, 17º36'N, 96ºW, 23–30.VII.1971, A. Newton (2, SBPC); 29.7 mi S Valle Nacional, 6800', 2–17.VIII.73, cloud for., A. Newton, 302 C (2, SBPC); same data except: 524d (1, SBPC); 21 mi S Valle Nacional, 5400', 22–31.VII.71, A. Newton, 306 Dh (1, SBPC); 24 mi S Valle Nacional, 6300', 23–30.VII.71, cloud for., A. Newton, 307 Dh (5, SBPC); 22.4 mi S Valle Nacional, 5600', 12–17.VIII.73, cloud forest, A. Newton, 523C (1, SBPC); 48 km S Valle Nacional, 2012 m, 25.VI–2.VIII.83, km 97, S. & J. Peck, FIT, montane oak for. (8, SBPC); same data and: 83-47 (2, SBPC); 32 mi S Valle Nacional, 7000', 21–24.V.71, S. Peck, forest dung T727–32 (2, SBPC); 20 mi S Juchatengo, 6000', 30.V.71, for. carrion, S. Peck (5, SBPC); same locality, 27–30.V.1971, for. dung traps, S. Peck, T744–49 (5, SBPC); same data except: for. car. tp, T750–3 (5, SBPC). GUERRERO: 7.5 mi W Mazatlan, 7100', 30.VIII–5.IX.71, A. Newton, 386 Dh (2, SBPC).

Distribution. Known only from the Mexican states of Guerrero and Oaxaca.

Bionomics. Recorded habitats are tropical evergreen forest, cloud forest, and montane oak forest from altitudes of 1645 m to 2164 m.

Etymology. The epithet *angustiformis* (Latin *angusti-*: narrow; *-form*: shape) refers to the narrow apex of the median lobe of the aedeagus of this species.

Dissochaetus bifurcus Peck and Cook, n.sp.
Fig. 19, 20, 48
http://zoobank.org/0F83078C-A5D8-4620-9F1F-E646D60D5FA1

Diagnostic description of male. Total length 2.3–2.8 mm; greatest width 1.2–1.6 mm. Color dark brown, head darker. Weakly shining. Vestiture pale. Head densely punctate; punctures separated by about one diameter. Antennae reaching base of elytra; antennomere 4 more than one-half length of 3; 6 distinctly shorter than 4 and 5; 7 clearly longer than 9 and 10; 9 and 10 longer than wide, transversely symmetrical. Pronotum widest at basal two-fifths. First protarsomere narrower than protibial apex. Large metatibial spur longer than first metatarsomere. Median lobe of aedeagus (Fig. 20) elongate; apical third drawn out, with one pair of lateral setae; apex weakly lobed. Inverted internal sac apically with elongate bifurcated patch of small spines and a small bifurcated sclerite; with patches of larger spines medially and basally; flagellum short. Parameres elongate, narrow, straight, weakly explanate apically, extending well beyond apex of median lobe. Genital segment (Fig. 19) elongate; apex of tergite rounded, bearing setae; lateral lobes of pleurites with a few apical setae; ventral lobes of pleurites broad, triangular, bearing apical setae, and each with a longitudinal dark strip midventrally; sternite absent.

This species is distinguished by the following combination of characters: median lobe of aedeagus narrowing from apical third, with weak apical lobe; inverted internal sac apically with an elongate, bifurcated patch of small spines; parameres narrow, straight, slightly explanate apically, extending well beyond apex of median lobe.

Type material. Holotype, male, with the following label data: "MEX[ICO]: Hid. [HIDALGO]; 2.5 mi N/ Tlanchinol, 5200'/ 8-11.VII.73, cloud/ for, A. Newton 497Dh" (SBPC). Paratypes (36): with same data as holotype (6); 2.8 mi N Tlanchinol, 5200', 6–11.VII.73, cloud for., A. Newton, 498 Dh (2, SBPC); same data except: 499 Dh (15, SBPC); same data except: 3.5 mi N Tlanchinol, 5100', 501 Dh (2, SBPC); 1 mi S St. Monica, 6000', 7–12.VII.73, sweetgum for., A. Newton, 504 Dh (1, SBPC); Tlanchinol, 43 km SW Huejutla, 14.VI–4.VIII.83, S. & J. Peck, 1500m, cloud forest, FIT (9, SBPC); same data except: S. Peck, 83-40 (1, SBPC).

Additional material examined. CHIAPAS: 8 mi N Pueblo Nuevo, 6000', cloud for., 26–27.VIII.71, A. Newton (6, SBPC). OAXACA: 23 mi S Valle Nacional, 5750', 9–12.VIII.70, cloud forest, A. Newton, 145 Dh (1, SBPC); 18 mi S Valle Nacional, 4800', 9–12.VIII.1970, Dh, ravine, A. Newton (1, SBPC); same data except: W slope, #2 (1, SBPC); 25 mi S Valle Nacional, W slope, 6350', 10–12.VIII.1970, A. Newton, #4, cloud forest, human dung (1, SBPC); 18 mi S Valle Nacional, 4800', 22–31.VII.71, trop. subevgn. for., A. Newton, 299 Dh (1, SBPC); 15 mi S Valle Nacional, 4300', 20–31.VII.71, trop. subevgn. for., A. Newton, 303 Dh (2, SBPC); 19 mi S Valle Nacional, 5100', 22–31.VII.71, cloud forest, A. Newton, 305 Dh; 22.4 mi S Valle Nacional, 5600', 12–17.VIII.73, cloud forest, A. Newton, 523 C (5, SBPC). PUEBLA: 1 mi S Honey, 6800', 1–6.VII.1971, A. Newton, 266 Dh (1, SBPC); 4 mi E Teziutlan, km 59, 10–14.VII.71, 5000', A. Newton, 281 Dh (9, SBPC). SAN LUIS POTOSI: Xilitla area, Trinidad, 6500', 25.II–3.III.81, O. Kukal, carrion (1, SBPC); Xilitla Plateau, Trinidad, 6500', 25.II–3.III.81, car. trap (3, SBPC); 14 km W Xilitla, 4800', km 240, 20–28. VI.71, A. Newton, 250 Dh (1, SBPC). VERACRUZ: 1.2 mi S Huatusco, 1344 m, 2–5.VIII.69, cloud for., S. & J. Peck, 541 Dh (2, SBPC); same data except: 5–8.VIII.69, car., 549–50 (4, SBPC).

Distribution. Recorded from the Mexican states of Chiapas, Hidalgo, Oaxaca, Puebla, San Luis Potosi, and Veracruz.

Bionomics. Recorded habitats are cloud forest, sweetgum (*Liquidambar*) forest, and subtropical evergreen forest from altitudes of 1310 m to 2072 m.

Etymology. The epithet *bifurcus* (Latin adjective: two-pronged) refers to the long bifurcated patch of small spines in the aedeagal internal sac of this species.

Dissochaetus brevis Peck and Cook, n.sp.
Fig. 21, 22, 49
http://zoobank.org/6E0ED193-A1FF-4341-9642-AFFB804D37DA

Diagnostic description of male. Total length 2.6–3.0 mm; greatest width 1.3–1.5 mm. Color dark brown, head darker; antennomeres 1, 2 and 11, mouthparts and tarsi paler. Weakly shining. Vestiture pale. Head densely punctate; punctures separated by less than one diameter. Antennae reaching base of elytra; antennomere 4 about two-thirds length of 3; 6 shorter than 4 and 5; 7 slightly longer than 9 and 10; 7, 9 and 10 transversely symmetrical. Pronotum widest at basal two-fifths. First protarsomere about as wide as protibial apex. Large metatibial spur about as long as first metatarsomere. Median lobe of aedeagus (Fig. 21) elongate, narrowing in apical one-half; apex curved ventrally, not distinctly lobed, bearing one pair of lateral setae. Inverted internal sac with large pair of patches of spines apically, smaller patches of spines medially and basally; pair of dark, curved sclerites at base. Parameres narrow, straight, not extending beyond apex of median lobe. Genital segment (Fig. 22) longer than wide, sides nearly straight; apex of tergite nearly truncate, bearing a few setae; lateral lobes of pleurites with lateral setae; row of setae extending from apices of lateral lobes to apices of ventral lobes; apices of ventral lobes not prominent, each bearing a pair of long setae on inner margin; sternite absent.

This species is distinguished by the following combination of characters: median lobe of aedeagus narrowing in apical one-half; inverted internal sac basally

with pair of dark sclerites; parameres narrow, straight, not extending beyond apex of median lobe.

Type material. Holotype, male, with the following label data: "MEX[ICO]: Mich[oacan]; 12 mi S/ Zitacuaro, Laguna de Vaca/ 8-10.IX.69, 9000', pine-/ Oak-fir for., dung & car./ traps 620-23, S.&J.Peck" (SBPC). Paratypes (30): with same data as holotype (14, SBPC). JALISCO: 18 mi W Atenquique, 9300', 10–18.IX.71, A. Newton, 404 Cs (1, SBPC); 14 mi W Atenquique, 7900', 10–18.IX.71, A. Newton, 405 Dh (8, SBPC); same data except: 13 mi W Atenquique, 407 Cs (4, SBPC); 14 mi W Atenquique, 7900', 10–13.IX.71, A. Newton, 495 Dh (3, SBPC).

Additional material examined: MEXICO: DURANGO: 41 mi SW Ciudad, 7500', 15–17.VI.71, for. carrion, S. Peck, T778 (2, SBPC). ESTADO DE MEXICO: 8–12 mi E Amecameca, c. 9000', pine forest, 30.VII.1969, S. & J. Peck, 535–7 Dh (1, SBPC). MORELOS: 4 mi S Tres Cumbres, 8500', km 58, 29.VIII–4.IX.71, A. Newton, 376 Dh (4, SBPC); 7 mi W Tres Cumbres, 9600', km 12, 29.VIII–4.IX.71, A. Newton, 373 Dh (1, SBPC); 4 mi W Tres Cumbres, 9000', 29.VIII–4.IX.71, woodland, A. Newton, 374 Dh (10, SBPC); same data except: 375 Dh (5, SBPC). OAXACA: 52 mi N Oaxaca, 9500', 16–23.V.71, S. Peck, forest dung T713–14 (2, SBPC); same data except: 16–25.V.71, for. carrion T715 (4, SBPC); 20 km N Oaxaca, 9500', 1–7.VI.1971, for., carrion, S. Peck, T756 (4, SBPC); same data except: T756–8 (2, SBPC); same data except: dung T759–61 (6, SBPC); same data except: 7.VI.71, under carrion (1, CNCI); 3 mi N Suchixtepec, 9500', 4–6. VI.71, S. Peck, for. carrion 766–7 (1, SBPC); 35 mi S Valle Nacional, SE slope, 8000', 10–12.VIII.1970, A. Newton #6, oak forest, human dung (1, SBPC); same data except: 148 Dh (2, SBPC); 56 mi S Valle Nacional, 10,000', 16–25.V.1971, S. Peck, T713–15, carrion & human dung tps. (1, CNCI); 25 mi N Ixtlan, 9100', 23–29.VII.71, A. Newton, 313 Dh (5, SBPC); same data except: 313 Cs (4, SBPC); 20 mi N Ixtlan de Juarez, 9300', 24–27.VII.71, pine-oak, A. Newton, 314 Dh (3, SBPC); 16 mi N Ixtlan, 9400', 24–27. VII.71, A. Newton, 315 Dh (7, SBPC); Yuvila Rd., 1 mi E jct 175, 8600', 24–27.VII.71, A. Newton, 318 Cs (5, SBPC); 35.9 mi S Valle Nacional, 11–18.VIII.73, mesic oak-pine, A. Newton, 526 Cs (1, SBPC); 27.3 mi N Ixtlan de Juarez, 9200', 11–18.VIII.73, oak-pine for., A. Newton, 527 C (1, SBPC); 10.4 mi N Ixtlan de Juarez, 9100', 10–18.VIII.73, oak-pine, A. Newton, 528e (6, SBPC); Yuvila Rd., 4.1 mi E jct Mex. 175, 7900', 9–19.VIII.73, oak-pine for., Newton, 534 Dh (1, SBPC); Yuvila Rd., 1.4 mi E jct Mex.175, 9300', 9–19.VIII.73, oak-pine for., Newton, 536 Dh (3, SBPC); same data except: 536 C (1, SBPC); 1.7 mi W jct 175, Yuvila Rd., 9400', 9–19.VIII.73, oak-pine, A. Newton, 537 C (1, SBPC); 2 mi W jct 175, Yuvila Road, 8–14.VIII.73, oak-pine, A. Newton, 538 Dh (5, SBPC); 4 mi W jct 175, Yuvila Road, 9300', 8–19.VIII.73, Fish trap, 539c, A. Newton (4, SBPC); 53 mi N Oaxaca, 10,000', 25.V.71, beating veg., H.F. Howden (1, SBPC); 10 km N San Juan del Estado, 7.VIII.1986, H. & A. Howden (7, SBPC).

Distribution. The species is known from the Mexican states of Durango, Jalisco, Michoacan, Estado de Mexico, Morelos, and Oaxaca.

Bionomics. Recorded habitats are pine-oak-fir forest, pine forest, woodland, oak forest, and mesic oak pine forest, and at altitudes of 2286 m to 3048 m.

Etymology. The epithet *brevis* (Latin adjective: short) refers to the length of the parameres of this species.

Dissochaetus chiapensis Peck and Cook, n.sp.
Fig. 25, 26, 48
http://zoobank.org/44395626-72B0-43D0-B3F6-D3DFAE9429C3

Diagnostic description of male. Total length 2.4–2.8 mm; greatest width 1.3–1.4 mm. Color medium brown to dark brown; head darker; mouthparts, antennomere 1 and apical half of 11, and tarsi paler. Weakly shining. Vestiture yellowish. Head punctate; punctures separated by about one diameter. Antennae reaching base of elytra; antennomere 4 more than one-half length of 3; 6 distinctly shorter than 4 and 5; 7 slightly longer than 9 and 10; 7, 9 and 10 transversely weakly asymmetrical, appearing weakly lobed on one side. Pronotum widest at basal two-fifths. First protarsomere about as wide as protibial apex. Large metatibial spur extending beyond first metatarsomere. Median lobe of aedeagus (Fig. 25) elongate, triangular, narrowing apically, without lateral setae. Inverted internal sac with two pairs of elongate sclerites and apical patches of small spines; flagellum not seen. Parameres elongate, inwardly curved apically; apices each with toothlike process. Genital segment (Fig. 26) longer than wide; apex of tergite rounded, setose; lateral lobes of pleurites rounded apically, each with pair of setae; ventral lobes of pleurites inwardly curved, with truncate apices bearing a number of setae; sternite present, reduced to short, broad sclerite bearing two apical setae.

This species most closely resembles *D. hetschkoi*, from which it differs in larger size, broader apex of median lobe of aedeagus lacking lateral setae, ventral lobes of pleurites of male genital segment broader with truncate apices.

Type material. Holotype, male, with the following label data: "MEX.[MEXICO]: Chiapas, 4 mi/ S Palenque, 600', rain/ forest, 7-15.VIII.1971,/ A. Newton 326 Dh" (SBPC). Paratypes (6): MEXICO: CHIAPAS: 6.5 mi S Palenque, 900', rain forest, 7–15.VIII.1971, A. Newton, 329 Dh (1, SBPC); 7 mi S Palenque, 1100', 7–15.VIII.1971, A. Newton, 331 Dh (1, SBPC); 15 mi NW Ocozocoautla, 2800', 19–25.VIII.71, rainforest, A. Newton, 360 Dh (1, SBPC); same data except: 361 Dh (1, SBPC); 12 mi NW Ocozocoautla, 3400', 19–25.VIII.71, A. Newton, 362 Dh (2, SBPC).

Distribution. Known only from the Mexican state of Chiapas.

Bionomics. Known only from rainforest habitats at altitudes of 182 m to 1036 m.

Etymology. The epithet *chiapensis* (Chiapas + Latin suffix -*ensis*, locality) refers to the occurrence of this species in the Mexican state of Chiapas.

Dissochaetus claviformis Peck and Cook, n.sp.
Fig. 1, 23, 24, 50
http://zoobank.org/E13DB739-BCDC-42B2-AEAC-BA74B6B15C05

Diagnostic description of male. Total length 2.7–3.4 mm; greatest width 1.4–1.7 mm. Color brown, head darker; antennomeres 1–4 and apical half of 11, mouthparts and tarsi paler. Moderately shining. Vestiture pale. Head densely punctate; punctures separated by about one diameter. Antennae reaching base of elytra; antennomere 4 about one-half length of 3; 6 distinctly shorter than 4 and 5; 7, 9 and 10 robust, strongly transversely asymmetrical, appearing lobed on one side. Pronotum widest at basal two-fifths. First protarsomere slightly wider than protibial apex. Large metatibial spur slightly longer than first metatarsomere. Median lobe of aedeagus (Fig. 23) triangular, evenly narrowing to apex, bearing one pair of lateral setae; apex weakly curved ventrally. Inverted internal sac with two pairs of large sclerites; basal pair dark; apical pair longer, paler, with narrow, outwardly curved apices. Parameres extend well beyond apex of median lobe; broad in dorsal view, outer margin inwardly curved in apical fourth. Genital segment (Fig. 24) longer than wide, sides evenly rounded; apical margin of tergite setose on each side of median emargination; lateral lobes of pleurites bear a few setae; ventral lobes of pleurites triangular, each with a row of strong setae on outer margin; sternite absent.

This species can be distinguished by the following combination of characters: median lobe of aedeagus short, broad, evenly narrowed to apex; inverted internal sac with two pairs of large sclerites, apical pair with outwardly curved apices; parameres elongate, broad in dorsal view with outer margin inwardly curved apically; male genital segment with evenly curved sides.

Type material. Holotype, male, with the following label data: "MEX.[MEXICO]: Hgo.[HIDALGO]; Tlanchinol/ 43 km SW Huejutla/ 14.VI–4.VIII.83, 1500m/ cloud forest S. Peck 83-40". Paratypes (50): with same data as holotype (6, SBPC). CHIAPAS: Lagunas, Montebello, 14–17.VIII.1969, 4500', trop. mont. for., S. Peck, carrion, 563–568 (8, SBPC); Lagunas de Montebello, Laguna Pojoj, 1500 m, 2.VI.1990, FIT, H. & A. Howden, B. Gill (6, SBPC); 8 mi N Pueblo Nuevo, 6000', cloud for., 26–27. VIII.71, A. Newton (1, SBPC); 6.6 mi W El Bosque, 4800', 25–29.VIII.73, cloud forest, A. Newton, 542 (1, SBPC). HIDALGO: 2 mi NE Chapulhuacan, 2600', 22–29.VI.71, A. Newton, 254 Dh (1, SBPC); 4 mi SW Chapulhuacan, 3500', km 155, 22–29.VI.71, A. Newton, 255 Dh (1, SBPC); 6 mi SW Chapulhuacan, 3900', km 151, 23–29. VI.71, A. Newton, 256 Dh (1, SBPC); 10 mi NE Rancho Viejo, 5100', km 131, 23–29.VI.71, A. Newton, 257 Dh (1, SBPC); 6.6 mi SW Chapulhuacan, 3900', 27.VI–1.VII.73, A. Newton, Cs 494 (5, SBPC); 2.5 mi N Tlanchinol, 5200', 8–11.VII.73, cloud for., A. Newton, 497 Dh (3, SBPC); 2.8 mi N Tlanchinol, 5200', 6–11.VII.73, cloud for., A. Newton, 498 Dh (3, SBPC); 2.4 mi S Tianquistergo, 6200', 7–12.VII.73, Alnus woodland, A. Newton, 503 (1, SBPC). OAXACA: 15 mi S Valle Nacional, 4000', 20–25.V.71, S. Peck, for. carrion, T723–4 (1, SBPC); 1220 m, 26 km E Valle Nacional, 25.VI–2.VIII.83, km 71, S. & J. Peck, FIT, mont. trop. forest (3, SBPC); 18 mi S Valle Nacional, 1800', 9–12.VIII.1970, Dh, ravine, A. Newton (2, SBPC); 13 mi S Valle Nacional, 3600', 22–30.VII.71, trop. subevgn. for., A. Newton, 143 Dh (1, SBPC); 21 mi S Valle Nacional, 5400', 22–31.VII.71, A. Newton, 306, Dh (3, SBPC); 13.3 mi S Valle Nacional, 3700', 12–15.VIII.73, trop. evgn. forest, Newton, 522 C (2, SBPC).

Additional material examined. PUEBLA: Nuevo Necaxa, 1200 m, 25–28.VII.69, *Platanus* for., S. Peck, car 525 (3, SBPC); same data except: sycamore forest, malt syrup tps., S. & J. Peck, 526–530 (1. SBPC); 4 mi E Teziutlan, km 59, 10–14.VII.71, 5000', A. Newton, 281 Dh (1, SBPC). SAN LUIS POTOSI: 14 km W Ahuacatlan, Cueva de Potrerillos, 27.XI.72, J. Reddell, T. Raines (1, SBPC). VERACRUZ: 7 km E Huatusco, 22.VI–2.VIII.83, S. & J. Peck, 1250 m, cloud forest, FIT (13, SBPC); same data except: 22.VI–2.VII.83, carrion tp., 83-95 (3, SBPC); 1.2 mi S Huatusco, 1344 m, 5–8.VIII.69, cloud forest, S. & J. Peck, car., 549–50 (2, SBPC); 4 mi N Huatusco, 4100', 11–16.VII.71, A. Newton (2, SBPC); 2 mi S Huatusco, 4300', 11–17.VII.71, A. Newton, 289 Dh (2, SBPC); 1.7 mi N Teocelo, 3700', 22–24.VII.73, A. Newton, 510 Dh (1, SBPC).

Distribution. Reported from the Mexican states of Chiapas, Hidalgo, Oaxaca, Puebla, San Luis Potosi, and Veracruz.

Bionomics. Collected in habitats of cloud forest, tropical montane forest, *Alnus* woodland, tropical sub-evergreen forest, sycamore (*Platanus*) forest, and one cave, and at altitudes of 548 m to 1889 m.

Etymology. The epithet *claviformis* (Latin *clavi-*, club; *-formis*, shape) refers to the club-shaped parameres of this species.

Dissochaetus cristobalensis Peck and Cook, n.sp.
Fig. 27, 28, 49
http://zoobank.org/C66F3383-6681-4125-AC2D-1984ABA83C33

Diagnostic description of male. Total length 2.8–3.3 mm; greatest width 1.4–1.7 mm. Color dark brown, head darker; antennomeres 1–3, mouthparts and tarsi paler. Weakly shining. Vestiture pale. Head densely punctate; punctures separated by less than one diameter. Antennae reaching base of elytra; antennomere 4 about two-thirds length 3; 6 shorter than 4 and 5; 7 longer than 9 and 10; 7, 9 and 10 transversely symmetrical. Pronotum widest at base. First protarsomere as wide as protibial apex. Large metatibial spur about as long as first metatarsomere. Median lobe of aedeagus (Fig. 27) elongate, narrowing in apical third, curved ventrally, with small apical lobe; bearing two pairs of lateral setae. Inverted internal sac densely spinose apically; with small patches of spines medially; basally with a pair of distinctive, curved black sclerites with expanded bases; basal bulb black, flagellum elongate. Parameres elongate, straight, reaching beyond apex of median lobe. Genital segment (Fig. 28) longer than wide, sides straight, slightly widening toward base; apex of tergite rounded, bearing a few setae; lateral lobes of pleurites with a row of

lateral setae; triangular ventral lobes of pleurites densely setose laterally and medially; sternite absent.

This species is most easily identified by the distinctive pair of black sclerites and basal bulb at base of inverted internal sac of the aedeagus.

Type material. Holotype, male, with the following label data: "MEX[ICO]: Chiapas; 5 km W/ San Cristobal, 7700'/ 13–16.VIII.69, / pine-oak forest/ S. & J. Peck car. tp 560-62" (SBPC). Paratypes (37): with same data as holotype (5, SBPC); same data except: 8000', 16.VIII–3. IX.69 (3, SBPC); 5 km W San Cristobal, 8000', 16.VIII–3.IX.69, pine-oak for., S. Peck 557–62 (3, SBPC); same data and: car. tps (2, SBPC); same data except: 13–16. VIII.69, 9000', Dh tps (3, SBPC); 5 km W San Cristobal, 8000', 13–16.VIII.69, pine-oak, carrion tps, S. & J. Peck, 560–562 (7, SBPC); 6 mi W San Cristobal, 7700', km 75¼, 24–28.VIII.71, A. Newton, 354 Dh (8, SBPC); San Cristobal, 26–28.V.1990, dung, B. Gill (3, SBPC); San Cristobal, FIT, 27–27.V.1990, 2200 m, H. & A. Howden, B. Gill (1, SBPC); Mpio: Huixtán, Bazóm, 16º44'19.0"N, 92º29'18.3"W, 2450 m, 9.VII.2003, R. Anderson, mixed magnolia oak forest litter, 2003-106 (2, SBPC).

Distribution. Known only from the Mexican state of Chiapas.

Bionomics. Reported only from pine-oak and magnolia-oak forests at altitudes of 2200 m to 2743 m.

Etymology. The epithet *cristobalensis* (Cristobal + the Latin suffix -*ensis*, locality) refers to the type locality of this species near the city of San Cristobal de las Casas in the state of Chiapas, Mexico.

Dissochaetus lobatus Peck and Cook, n.sp.
Fig. 29, 30, 51
http://zoobank.org/23811204-0798-464D-B4F2-C171FAC6F073

Diagnostic description of male. Total length 2.6–2.8 mm; greatest width 1.4–1.5 mm. Color dark brown, head darker; antennomeres 1–4 and apex of 11, mouthparts and tarsi paler. Weakly shining. Vestiture pale. Head densely punctate; punctures separated by less than one diameter. Antennae short, barely reaching base of elytra; antennomere 4 about two-thirds length of 3; 6 shorter than 4 and 5; 7 longer than 9 and 10; 7, 9 and 10 transversely symmetrical. Pronotum widest at base. First protarsomere wider than protibial apex. Large metatibial spur shorter than first metatarsomere. Median lobe of aedeagus (Fig. 29) short, narrowing before sharply down-turned, lobed apex; with one pair of lateral setae. Inverted internal sac with two pairs of patches of small spines apically; medially with biramous patch of small spines and pair of patches of larger spines; basally with pair of dark, curved sclerites with widened apices; flagellum reaches middle of dark sclerites. Parameres elongate, straight, reaching well beyond apex of median lobe. Genital segment (Fig. 30) longer than wide, sides contracted at middle, widest basally; apex of tergite truncate, bearing a few setae; lateral lobes of pleurites strongly setose; ventral lobes of pleurites short, triangular, setose; sternite absent.

This species can be identified by the following combination of characters: median lobe of aedeagus short, strongly down-turned, lobed at apex; internal sac at base with pair of curved, black sclerites widening apically; parameres narrow, elongate, straight.

Type material. Holotype, male, with the following label data: "MEX.[ICO]: Sinaloa; 36 mi NE Concordia/ 6000', km 215.5/ 24-28.IX.71/ A. Newton 432Dh" (SBPC). Paratypes (21): with same data as holotype (1, SBPC). MEXICO: DURANGO: 41 mi SW Ciudad, 7500', 15–17.VI.71, for. carrion, S. Peck, T778 (3, SBPC); same data except: 778–9 (1, SBPC); 11 mi W El Salto, 9000', 14–17.VI.71, S. Peck, for. carrion, T774 (1, SBPC); 34 mi E El Salto, 7600', 30.IX.71, A. Newton, 450 (1, SBPC). HIDALGO: 10 mi SW Jacala, 1–3.VIII.60, Howden, malt trap (1, CNCI). NUEVO LEON: Iturbide, 1800 m, 17–23. VII.1979, dung trap, O. Kulal (1, SBPC); Monterrey, Chipinque Mesa, 5400', 21–25.VI.1969, for. dung tps. 470–72, S. & J. Peck (1, SBPC). OAXACA: 48 km s Valle Nacional, 2012 m, 25.VI–2.VIII.83, km 97, S. & J. Peck, FIT, montane oak for. (1, SBPC); 25 mi S Valle Nacional, 6350', 23–30.VII.71, A. Newton, 146 Cs (1. SBPC); 29.7 mi S Valle Nacional, 6800', 2–17.VIII.73, cloud for., A. Newton, 302 C (1, SBPC); 30 mi S Valle Nacional, 6800', 10–13.VIII.70, cloud forest, A. Newton, 5 Dh (1, SBPC). QUERETARO: 11 mi W Jalpan, 4600', km 162.5, 21–27. VI.1971, A. Newton, 246 Dh (1. SBPC); 18 mi E Landa Matamoros, 5300', 28–30.VI.1973, A. Newton, 492 Cs (1, SBPC); same locality, 5500', 10–21.VI.71, S. Peck, carrion (1, SBPC); same data except: sinkhole litter (1, SBPC). SAN LUIS POTOSI: 1700 m, 40 km W Xilitla, 12.VI–6. VIII.83, S. & J. Peck, FIT, pine-oak forest (3, SBPC).

Distribution. Recorded from the Mexican states of Durango, Hidalgo, Nuevo Leon, Oaxaca, Queretaro, Sinaloa, and San Luis Potosi.

Bionomics. Reported from montane pine and pine-oak forests, and at altitudes of 1402 m to 2743 m.

Etymology. The epithet *lobatus* (Latin adjective, lobed) refers to the sharply down-turned, lobed apex of the median lobe of the aedeagus of this species.

Dissochaetus newtoni Peck and Cook, n.sp.
Fig. 31, 32, 52
http://zoobank.org/887BAA59-B1F0-4A80-91A0-1CB6C01728F0

Diagnostic description of male. Total length 1.8–2.4 mm; greatest width 1.0–1.4 mm. Color medium brown; vertex of head darker; mouthparts, antennomeres 1–6, apex of antennomere 11, and tarsi paler. Moderately shining. Vestiture yellowish. Head densely punctate, punctures separated by less than one diameter. Antennae reaching base of elytra; antennomere 4 more than one-half length of 3; 6 shorter than 4 and 5; 7 slightly longer than 9 and 10; 7, 9 and 10 transversely symmetrical. Pronotum widest before base. First protarsomere as wide as protibial apex. Large metatibial spur longer than first metatarsomere. Median

lobe of aedeagus (Fig. 32) broad, narrowing apically, with three pairs of lateral setae. Inverted internal sac with patches of small spines and irregularly shaped structures; basal bulb and flagellum well defined. Parameres elongate, reaching well beyond apex of median lobe, twisted before expanded apices. Genital segment (Fig. 31) as wide as long; apex of tergite with a few setae on each side of median emargination; lateral lobes of pleurites low, rounded, with apical setae; ventral lobes broadly triangular with apical setae; sternite present, reduced to small Y-shaped sclerite.

This species is most easily identified by the combination of small size, elongate parameres twisted before expanded apices, and broadly triangular ventral lobes of pleurites of male genital segment.

Type material. Holotype, male, with the following label data: "MEX.[MEXICO]: Ver.[VERACRUZ]; 8 mi NNW/ Sontecomapan, 500'/ Univ. Biol Sta.; forest/ 31.VII-4.VIII.1970/ A. Newton, #5 dung tp." (SBPC). Paratypes (58): with same data as holotype (4, SBPC); same date except: 5 Dh (4, SBPC); same data except: Dh#7 (7, SBPC); same data except: Cs (5, SBPC); same data except Dh (4, SBPC); same data except 325 Dh (5, SBPC); same data except: 140 Dh (10, SBPC); same data except: 31.VII-7.VIII.1970, carrion (1, SBPC); same data except: 29.VII-4.VIII.1970, #3 dung tp. (8, SBPC); same data except: 31.VII-5.VIII.1970, dung tp. (4, SBPC); same data except: 400', 3-5.VIII.1971, 325 Dh (3, SBPC); same data except: 420' (3, SBPC).

Additional material examined. CHIAPAS: 4 mi S Palenque, 600', 7-15.VIII.71, A. Newton, 325 Dh (1, SBPC); same data except: 15.VIII.71, 326 (2, SBPC); 6.5 mi S Palenque, 900', 7-15.VIII.71, rainfor., A. Newton, 329 Dh (4, SBPC); same data except: 7 mi S Palenque, 1100', 330 Dh (2, SBPC); same data except: 331 Dh (1, SBPC); same data except: 332 Dh (2, SBPC); 15 mi NW Ocozocoautla, 2800', 19-25.VIII.71, rainforest, A. Newton, 360, Dh (3, SBPC); same data except: 361 Dh (3, SBPC); same data except: 3400', oak-trop. evgrn. for., 363 Dh (5, SBPC); Ocosingo Rd., 76 km S Palenque, 5-29.VII.83, 760m, Peck & Anderson, FIT, rainforest (1, SBPC); Bonampok Rd., 100 km S Palenque, 8-24.VII.83, S.&J. Peck, 230m, rainforest, FIT (1, SBPC). OAXACA: 5 mi S Valle Nacional, 1600', 20.VII-1.VIII.71, A. Newton, 297 Dh (4, SBPC); same data except: 20-30.VII.71, sub-evrgn.for., 298 Dh (5, SBPC); same data except: 6 mi S Valle Nacional, 2000', 20-31. VII.71, trop. subevgn. for., 299 Dh (5, SBPC); same data as previous except: 2200', 22-31.VII.71, 300 Dh (4, SBPC); 9 mi N Valle Nacional, 10-30.VII-1.VIII.71, trop. subevgrn. for., A. Newton, 296 Cs (1, SBPC); same data as previous except: 100', 20.VII-1.VIII.71, 296 Dh (3, SBPC); 4.5 mi S Valle Nacional, trop. evgrn. for., 1500', 13-16.VIII.1973, A. Newton, 521, carrion (4, SBPC); same data as previous except: 5.7 mi S Valle Nacional, 2000' (4, SBPC); 6 mi S Valle Nacional, 18-20.V.1971, S. Peck, forest dung, T718 (3, SBPC); same data as previous except: T720 (1, SBPC). VERACRUZ: 8 mi NNW Sontecomapan, 200', 3-5.VIII.71, A. Newton, 323 Dh (1, SBPC); same locality, 400', 31.VII-4.VIII.70, A. Newton, 140 Dh (5, SBPC); same locality, 1200', 29.VII-4.VIII.70, A. Newton, 137 Cs (3, SBPC); 5 mi S Sontecomapan, 1100', 2-5.VIII.71, A. Newton, 322 Dh (3, SBPC); NNW Sontecomapan, 29.VII-4.VIII.70, A. Newton, rainf. (2, SBPC); 33 km NE Catemaco, 160 m, S.&J. Peck, Los Tuxtlas Biol. Sta., 1.VII-1.VIII.83, FIT, ridge rainforest (9, SBPC); same locality, 13-20.VII.1984, D.H. Lindeman (13, SBPC); 6 mi NE Catemaco, 1700', 2-5.VII.1971, A. Newton, 321 Dh (2, SBPC).

Distribution. Recorded only from the Mexican states of Chiapas, Oaxaca, and Veracruz.

Bionomics. Reported habitats are rainforest, oak-tropical evergreen forest, and tropical sub-evergreen forest and at altitudes of 60 m to 1036 m.

Etymology. This species is named in recognition of Dr. A.F. Newton of the Field Museum, Chicago, Illinois, USA. Dr. Newton's extensive fieldwork in Mexico contributed much of the material for this study.

Dissochaetus ocozocoautla Peck and Cook, n.sp.
Fig. 33, 34, 51
http://zoobank.org/44CBE1B2-9BD9-4F7B-80B5-6F55A4A6960B

Diagnostic description of male. Total length 1.9–2.0 mm; greatest width 1.0-1-1 mm. Color medium to dark brown; head darker; mouthparts, antennomeres 1, 2 and apex of 11, and tarsi paler. Weakly shining. Vestiture yellowish. Head punctate; punctures separated by about one diameter. Antennae reaching base of elytra; antennomere 4 about one-half length of 3; 6 shorter than 4 and 5; 7, 9 and 10 subequal in size, transversely symmetrical. Pronotum widest at basal one-third. First protarsomere slightly narrower than protibial apex. Large metatibial spur longer than first metatarsomere. Median lobe of aedeagus (Fig. 34) broad, apical half narrowing to drawn out apex; without lateral setae. Inverted internal sac with paired, irregularly shaped sclerites and patches of small spines; flagellum not seen. Parameres elongate, narrow throughout. Genital segment (Fig. 33) longer than wide; tergite shallowly emarginate with six apical and two subapical setae; pleurites with lateral lobes low and setose; ventral sections of pleurites bilobed, outer lobes elongate and narrow with setose apices, inner lobes triangular, not setose; sternite broad, short, with truncate apex bearing two median setae.

This species can be identified by the combination of small size, narrow paramere apices, bilobed ventral sections of pleurites of male genital segment, and truncate apex of sternite of male genital segment.

Type material. Holotype, male, with the following label data: "MEX.[MEXICO]: Chis.[CHIAPAS]; 15 mi NW/ Ocozocautla [Ocozocoautla], 2800'/ 19-25.VIII.71, rain for./ A. Newton 361 Dh" (SBPC). Paratypes (21): with same data as holotype (14, SBPC). CHIAPAS: same data as holotype except: 360 Dh (6, SBPC); 11 mi NW Ocozocoautla, 3400', 19–25.VIII.71, oak-trop. evgn. for., A. Newton, 363 Dh (1, SBPC).

Distribution. The species is known only from the Mexican state of Chiapas.

Bionomics. The reported habitat types are rainforest and oak-tropical evergreen forest at altitudes of 853 m to 1036 m.

Etymology. The epithet *ocozocoautla,* Latin noun in apposition, refers to the type locality of this species near the town of Ocozocoautla in the Mexican state of Chiapas.

Dissochaetus reniformis Peck and Cook, n.sp.
Fig. 35, 36, 52
http://zoobank.org/AD1800DC-BF1C-4A5F-AC57-7171A4399F80

Diagnostic description of male. Total length 2.4–3.2 mm; greatest width 1.3–1.7 mm. Color dark brown, head darker; antennomeres 1–6 and apex of 11, mouthparts and tarsi paler. Weakly shining. Vestiture pale. Head densely punctate; punctures separated by less than one diameter. Antennae reaching base of elytra; antennomere 4 more than one-half length of 3; 6 shorter than 4 and 5; 7 slightly longer than 9 and 10; 7, 9 and 10 nearly transversely symmetrical. Pronotum widest at basal one-fourth. First protarsomere nearly as wide as apex of protibia. Large metatibial spur longer than first metatarsomere. Median lobe of aedeagus (Fig. 35) elongate, broad, evenly narrowing to rounded, slightly down-turned apex; with two pairs of lateral setae. Inverted internal sac with three well-defined patches of small spines apically; patches of spines of various sizes medially; pair of distinctive black sclerites at base; flagellum short. Parameres elongate, slightly sinuate on inner margins, reaching well beyond apex of median lobe. Genital segment (Fig. 36) about as wide as long, sides rounded; apex of tergite with median emargination; lateral lobes of pleurites with a few lateral setae; ventral lobes of pleurites triangular, densely setose; sternite absent.

This species is distinguished by the following combination of characters: median lobe of aedeagus elongate, evenly narrowed to rounded apex; inverted internal sac with pair of broad, outwardly curved, black sclerites at base.

Type material. Holotype, male, with the following label data: "MEX.[ICO]: Chis. [CHIAPAS]; 8 mi N/ Pueblo Nuevo/ 6000', cloud for./ 26-27.VIII.71/ A. Newton" (SBPC). Paratypes (9): with same data as holotype (3, SBPC); 5 km W San Cristobal, 13–16.VIII.69, 9000', pine-oak for., Dh tps, S. & J. Peck, 557–62 (1, SBPC); Cueva Rancho Nuevo, San Cristobal, 16.VIII–3.IX.1969, S. & J. Peck, twilight (2, SBPC); San Cristobal, 26–28.V.1990, dung, B. Gill (2, SBPC); San Cristobal, FIT, 26–27.V.1990, 2200m, H. & A. Howden, B. Gill (1, SBPC).

Distribution. The species is known only from the Mexican state of Chiapas.

Bionomics. The recorded habitat types are cloud forest and pine-oak forest at altitudes of 1828 m to 2743 m.

Etymology. The epithet *reniformis* (Latin *reni-*, kidney; *-formis*, shape) refers to the shape of the basal sclerites of the aedeagal internal sac of this species.

Dissochaetus sinuosus Peck and Cook, n.sp.
Fig. 37, 38, 53
http://zoobank.org/65414EA8-E077-475F-A078-E053BD6DB466

Dissochaetus aztecus Szymczakowski, 1971: 402; Peck, 1973: 105 (report from Mexico a misidentification).

Diagnostic description of male. Total length 2.3–3.2 mm; greatest width 1.3–1.7 mm. Color dark brown, head darker; antennomeres 1, 2 and 11, mouthparts and tarsi slightly paler. Weakly shining. Vestiture pale. Head densely punctate; punctures separated by less than one diameter. Antennae reaching base of elytra; antennomere 4 about one-half length of 3; 6 shorter than 4 and 5; 7 slightly longer than 9 and 10; 7, 9 and 10 nearly transversely symmetrical. Pronotum widest at basal two-fifths. First protarsomere about as wide as protibial apex. Large metatibial spur about as long as first metatarsomere. Median lobe of aedeagus (Fig. 37) elongate, narrowing in apical third; apex curved ventrally, not distinctly lobed, bearing two pairs of lateral setae. Inverted internal sac apically with elongate pair of patches of small spines; medially and basally with four paired patches of spines; a pair of dark sclerites at base. Parameres narrow, weakly sinuate, extending beyond apex of median lobe. Genital segment (Fig. 38) longer than wide, sides evenly rounded; apex of tergite rounded, bearing a few setae; lateral lobes of pleurites with a few setae laterally; ventral lobes of pleurites triangular, densely setose; sternite absent.

This species is distinguished by the following combination of characters: median lobe of aedeagus narrowing from apical third; inverted internal sac basally with a pair of dark sclerites; parameres narrow, weakly sinuate, extending beyond apex of median lobe.

Type material. Holotype, male, with the following label data: "MEX. [MEXICO]: Oax. [OAXACA]; 6.6 mi N/ Ixtlan Juarez, 8300'/ 10-18.VII.73, oak wood/ land, A. Newton 529 Dh" (SBPC). Paratypes (38): with same data as holotype (4, SBPC); 14.2 mi S Ixtlan Juarez, 7600', 10–18.VIII.73, oak wood land, A. Newton, 530 Dh (1, SBPC); 17.6 mi S Ixtlan Juarez, 7900', 10–19.VIII.73, oak wood land, A. Newton, 531 Dh (7, SBPC); Yuvila Rd., 2.3 mi E jct. Mex 175, 8100', 9–19.VIII.73, oak-pine, A. Newton, 515 Cs (5, SBPC); 29.7 mi S Valle Nacional, 6800', 2–17. VIII.73, cloud forest, A. Newton, 524 d (6, SBPC); 48 km E Valle Nacional, 2012 m, 25.VI–2.VIII.83, km 97, S. & J. Peck, FIT, montave [montane] oak for. (6, SBPC); 32 mi S Valle Nacional, 7000', 21–24.V.71, S. Peck, for. carrion, T733–38 (1, SBPC); same data except: forest dung, T727–32 (1, SBPC); 8 km S Suchixtepec, 10.VIII.1986, H. & A. Howden (3, SBPC); 3.5 mi S Suchixtepec, 8000', 3–4. VI.71, S. Peck, for. carrion, T765 (4, SBPC).

Additional material examined. MEXICO: CHIAPAS: 5 km E San Cristobal, 16.VII–3.IX.69, pine-oak for. car. tps, S. & J. Peck, 557–62 (1, SBPC). HIDALGO: 6.4 mi S Tenango de Doria, 3000', 24–28.VII.69, S. & J. Peck (1, SBPC); same data and: for. car. tps, 510 (12, SBPC); same data except: 510–11 (4, SBPC); same data except: 512–513 (13, SBPC); 16.4 mi W Tenango de Doria, 3000 m, 23.VII.1969, oak for., S. & J. Peck, Dh trap (1, SBPC); 11.1 mi S Tenango de Doria, 2500', 24–28.VII.69, pine

for., S. Peck, 516 Dh (1, SBPC); 7 mi SW Tenango de Doria, 2–6.VII.71, 7000', A. Newton, 131 Dh (8, SBPC); 12 mi SW Jacala, 6200', 23–30.VI.71, A. Newton, 259 Dh (1, SBPC); 2 mi S El Chico, 9600', 1–6.VII.71, A. Newton, 261 Dh (1, SBPC); 7 mi SW Tenango de Doria, 1–7.VII.71, 7000', A. Newton, 265 Dh (13, SBPC); 4 mi E Acaxochitlan, 6900', Naupan rd., mi. 3, 2–7.VII.71, A. Newton, 267 Dh (9, SBPC); 6.5 mi S Tianguistengo, 6800', 7–12.VII.1973, oak-pine forest, A. Newton, 502 Dh (10, SBPC); 2.4 mi S Tianguistengo, 6200', 7–12.VII.73, *Alnus* wood land, A. Newton, 503 (4, SBPC); 1 mi S St. Monica, 7–12.VII.73, 6000', liquidamber for., A. Newton, 504 Dh (14, SBPC); same data except: sweetgum for. (10, SBPC). JALISCO: 18 mi W Atenquique, 9300', 10–18.IX.71, A. Newton, 404 Cs (2, SBPC). ESTADO DE MEXICO: 8–12 mi E Amecameca, ca 9000', 30.VII–1.VIII.69, pine-fir forest, S. & J. Peck, car., 531–4 (8, SBPC). MICHOCAN: 70 km E Morelia, Mil Cumbres, 8–10.IX.69, 9000', pine-oak, S. Peck, 612–4 (1, SBPC); 12 mi E Zitacuaro, Lengua de Vaca, 8–10.IX.69, 9000', pine-oak-fir for., S. & J. Peck, 620–23 car. (2, SBPC). NUEVO LEON: Monterrey, Chipinque Mesa, 4000', 25–26.V.71, for. dung tps., 223 Dh, A. Newton (1, SBPC); same locality, 5400', 21–25.VI.69, for. dung tps., 470–72, S. & J. Peck (2, SBPC); Iturbide, 1800 m, 17–23.VII.1979, dung trap, O. Kukal (5, SBPC); 13 mi W Montemorelos, Cueva de Chorros de Agua, 19–25.VI.69, S. & J. Peck, dogfood bait traps (3, SBPC, as *D. aztecus* Szymczakowski in Peck, 1973); Cueva de Chorros de Agua, 4.10.66, W. Russell (5, SBPC, as *D. aztecus* Szymczakowski in Peck, 1973) OAXACA: 48 km E Valle Nacional, km 97, 2012 m, 25.IV–2.VIII.83, S. & J. Peck, FIT, montane oak for. (4, SBPC); 32 mi S Valle Nacional, 7000', 21–24.VI.1971, forest, S. Peck, dung tp, 733–38 (6, SBPC); same data except 21–24.V.71, T727–32 (3, SBPC); 25 mi S Valle Nacional, 6350', 23–30.VII.1971, A. Newton (2, SBPC); 23 mi S Valle Nacional, W slope, 5750', 9–12.VIII.1970, A. Newton #3, cloud forest, human dung (1, SBPC); 30 mi S Valle Nacional, 6800', 10–13.VIII.1970, cloud forest, A. Newton 5Dh (4, SBPC); 35 mi S Valle Nacional, 8000', 10–12.VIII.70, oak forest, A. Newton, 148 Dh (4, SBPC); 24 mi S Valle Nacional, 6300', 23–30.VII.71, cloud for., A. Newton, 308 Dh (1, SBPC); 30 mi S Valle Nacional, 6800', 23–29.VII.71, A. Newton, 308 Dh (2, SBPC); 34 mi S Valle Nacional, 8000', 11–18.VIII.73, mesic oak-pine, A. Newton, 525 c (6, SBPC); Yuvila Rd., 1 mi E jct 175, 8600', 24–27.VII.71, A. Newton, 318 Cs (1, SBPC); Yuvila Rd., 5 mi E jct Mex. 175, 7600', 9–19.VIII.73, oak-pine for., Newton, 533 Dh (2, SBPC); Yuvila Rd., 4.1 mi E jct Mex. 175, 7900', 9–19.VIII.73, oak-pine for., Newton, 534 Dh (4, SBPC); 12 mi S Sola Vega, 6500', 27–31.V.71, S. Peck, oak for., traps 742 (1, SBPC); 10 km N San Juan del Estado, 7.VIII.1986, H. & A. Howden (1, SBPC); 8 km S Suchixtepec, 10.VIII.1986, H. & A. Howden (32, SBPC); 3,5 mi S Suchixtepec, 8000', 3–4.VI.71, S. Peck, for., carrion, T765 (4, SBPC); same data except: 2–4.VI.71, dung tp 761–64 (5, SBPC); 3 mi N Suchixtepec, 9500', 4–6.VI.71, S. Peck, for., dung, T768–9 (8, SBPC). PUEBLA: 5 mi W Huauchinango, 6100', 3–7.VII.71, Newton, 268 (10, SBPC); same data except: 6000', 269 Dh (8, SBPC); same data except: 5900', 270 Dh (16, SBPC); 4.4 mi SW Huauchinango, ca 1700 m, moist ravine Dt. oak for., 25–28.VII.1969, S. & J. Peck (7, SBPC); same data except: 1700 m, oak forest, 519–20 dung tp. (4, SBPC); same data except: ravine oak forest, 521–22 (11, SBPC). QUERETARO: 17 mi E Landa de Matamoros, Km 229, 20–28.VI.71, 5300', A. Newton, 248 Dh (1, SBPC); 5 mi SW Pinal de Amoles, 21–17.VI.71, 7400', pine-oak for., A. Newton, Dh 244 (1, SBPC); SAN LUIS POTOSI: 40 km W Xilitla, 1700 m, FIT, 12.VI–6.VIII.83, pine-oak for., S. & J. Peck, 83-38 (7, SBPC); 20 km W Xilitla, 1600 m, 12.VI–6.VIII.83, S. & J. Peck, cloud forest (4, SBPC); Xilitla area, Trinidad, 6500', 25.II–3.III.81, O. Kukal, carrion (3, SBPC); same data except: Xilitla Plateau, car. tp. (8, SBPC). TAMAULIPAS: Gomez Farias, Rancho del Cielo, Cueva de la Mina, 5000', 1.VII.1969, S. & J. Peck (1, SBPC, as *D. aztecus* Szymczakowski in Peck, 1973). VERACRUZ: 5 mi E Las Vigas, 7600', *Alnus* woods, 19–22.V.73, A. Newton, 509 Dh (9, SBPC); 20.6 mi W Ciudad Mendoza, pine-oak-*Alnus*, 8500', 27.VII–3.VIII.73, Newton, 577 Cs (5, SBPC); 13.5 mi W Cd. Mendoza, rt 150D, 27.VII–3.VIII.73, pine-oak-*Alnus,* 7500', A. Newton, 516 Cs (1, SBPC).

Distribution. The species is known from the Mexican states of Chiapas, Hidalgo, Jalisco, Estado de Mexico, Michoacan, Nuevo Leon, Oaxaca, Puebla, Queretaro, San Luis Potosi, Tamaulipas, and Veracruz.

Bionomics. The reported habitat types are oak woodland and forest, pine-oak forest, cloud forest, sweetgum (*Liquidambar*) forest, pine-fir forest, pine-oak-fir forest, *Alnus* forest, pine-oak-*Anus* forest, and a few caves and at altitudes of 762 m to 2926 m.

Etymology. The epithet *sinuosus* (Latin adjective: sinuous) refers to the shape of the parameres of this species.

Dissochaetus texanus Peck and Cook, n.sp.
Fig. 39, 40, 53
http://zoobank.org/703E97F3-1175-40E5-9CD1-7760A2634DA0

Dissochaetus mexicanus Jeannel, 1936: 152; Peck, 1999: 184 (report from Texas a misidentification).

Diagnostic description of male. Total length 3.0–3.2 mm; greatest width 1.6–1.7 mm. Color dark brown, head and antennal club slightly darker. Weakly shining. Vestiture yellowish. Head densely punctate; punctures in irregular lines, separated by less than one diameter. Antennae reaching base of elytra; antennomere 4 more than one-half length of 3; 6 distinctly shorter than 4 and 5; 7 longer than 9 and 10; 7, 9 and 10 transversely symmetrical. Pronotum widest at basal fourth. First protarsomere as wide at protibial apex. Large metatibial spur about two-thirds length of first metatarsomere. Median lobe of aedeagus (Fig. 39) short, broad, narrowing in apical half to rounded, lobed, strongly down-turned apex bearing two pairs of lateral setae. Inverted internal sac apically with pair of patches of short, blunt spines; medially with inwardly directed large spines and pair of patches of apically directed spines; flagellum narrow, inserted in basal bulb. Parameres straight, extending well beyond apex of median lobe. Genital segment (Fig. 40) quadrate, longer than wide, sides nearly parallel; apex of tergite weakly emarginate medially, sparsely setose; lateral

lobes of pleurites rounded, sparsely setose; ventral lobes of pleurites triangular apically, strongly setose; sternite absent.

D. texanus is similar to *D. cristobalensis* and *D. lobatus* but differs from those species in the absence of paired sclerotized structures in the internal sac of the aedeagus.

Type material. Holotype, male, with the following label data: "[USA:]TX [Texas]: Brew.[Brewster] Co., Big Bend/ NP, .5 mi E Boot Spring/ 6000', S. Peck, car./ 7-11. VIII.75, for." (SBPC). Paratypes (55): with same data as holotype (4, SBPC); TEXAS: Brewster Co., Big Bend NP, N side Mt. Emory, 58–6400', S. Peck, dung, 30.VII–4. VIII.75, oak-pinyon woods (33, SBPC); TX: Brewster Co., Big Bend NP, Boot Spring, 6400', 1–4.VIII.75, S. Peck, oak-fir-pond. pine, carrion tp., 30–31 (14, SBPC); TX: Brewster Co., Big Bend NP, Boot Spring, 6300', 1–4. VIII.75, S. Peck, oak-fir-pine for., dung traps (3, SBPC); TX: Brewster Co., Big Bend NP, B Green Gulch, 5600', 28.VII–2.VIII.75, S. Peck, car. tp 22–23, oak-pinyon woodl. (1, SBPC).

Distribution. Although this species has been collected only in Brewster Co., Texas, USA, we expect that it may occur as well in the Mexican states of Chihuahua and/or Coahuila, at least in the Sierra del Burro and the Sierra del Carmen.

Bionomics. Recorded habitat types are semi-arid oak-pinyon-pine woodlands and oak-fir-pine forests and at altitudes of 1706 m to 1950 m.

Etymology. The epithet *texanus* (*tex*: state of Texas; *-anus,* Latin suffix: belonging to) refers to the occurrence of this species in the USA state of Texas.

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Figure 1. *Dissochaetus claviformis* Peck and Cook. Habitus, dorsal.

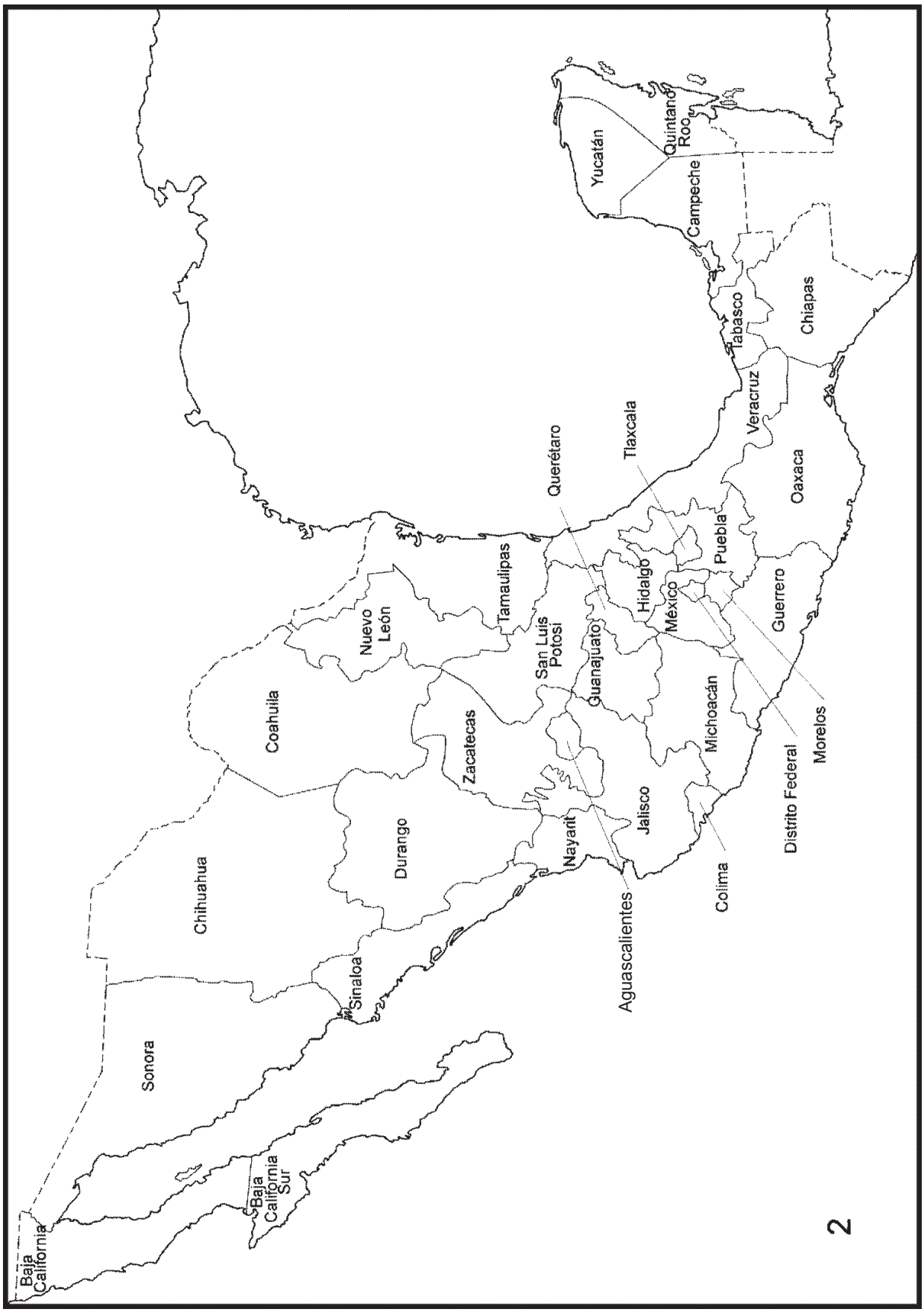
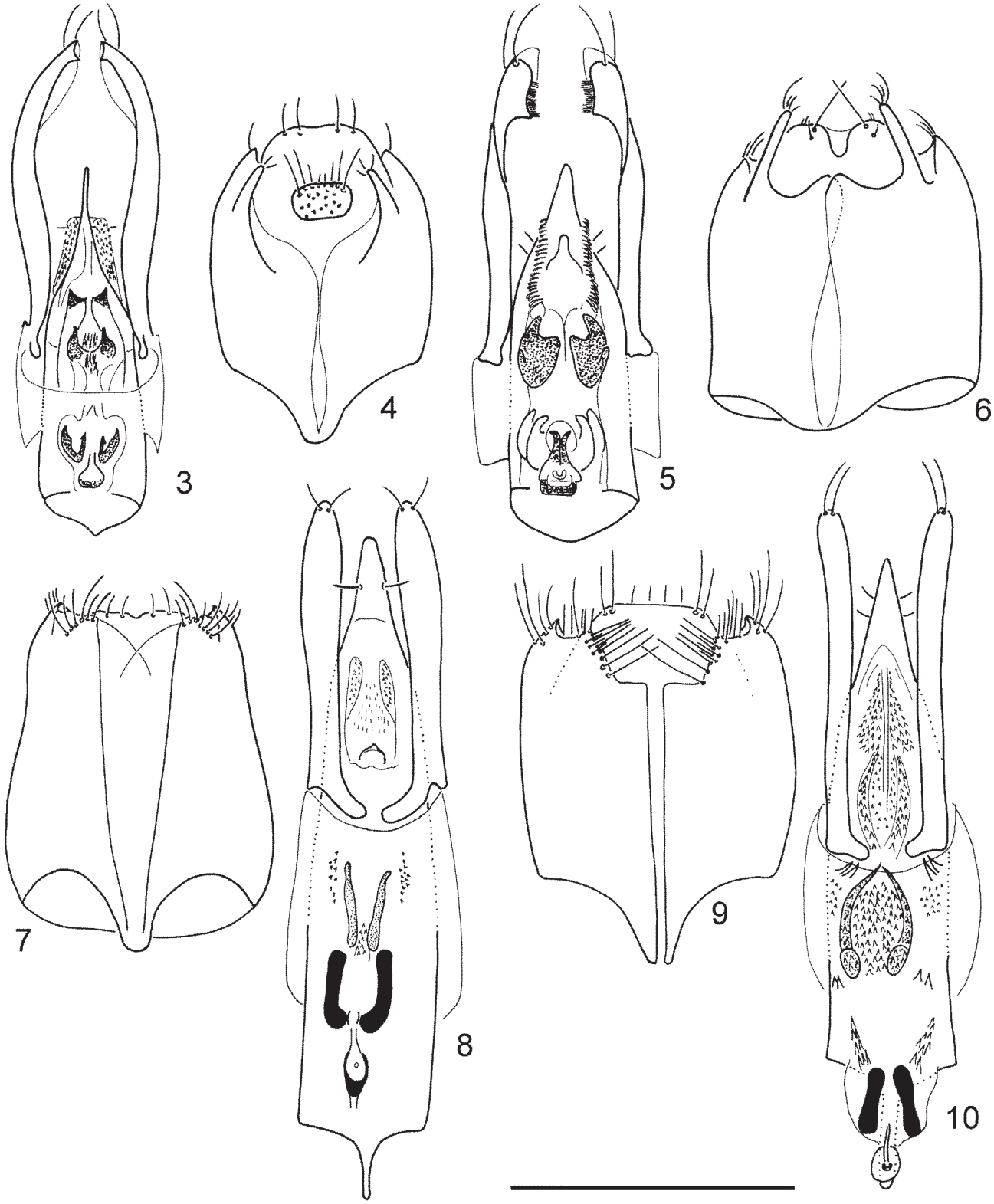
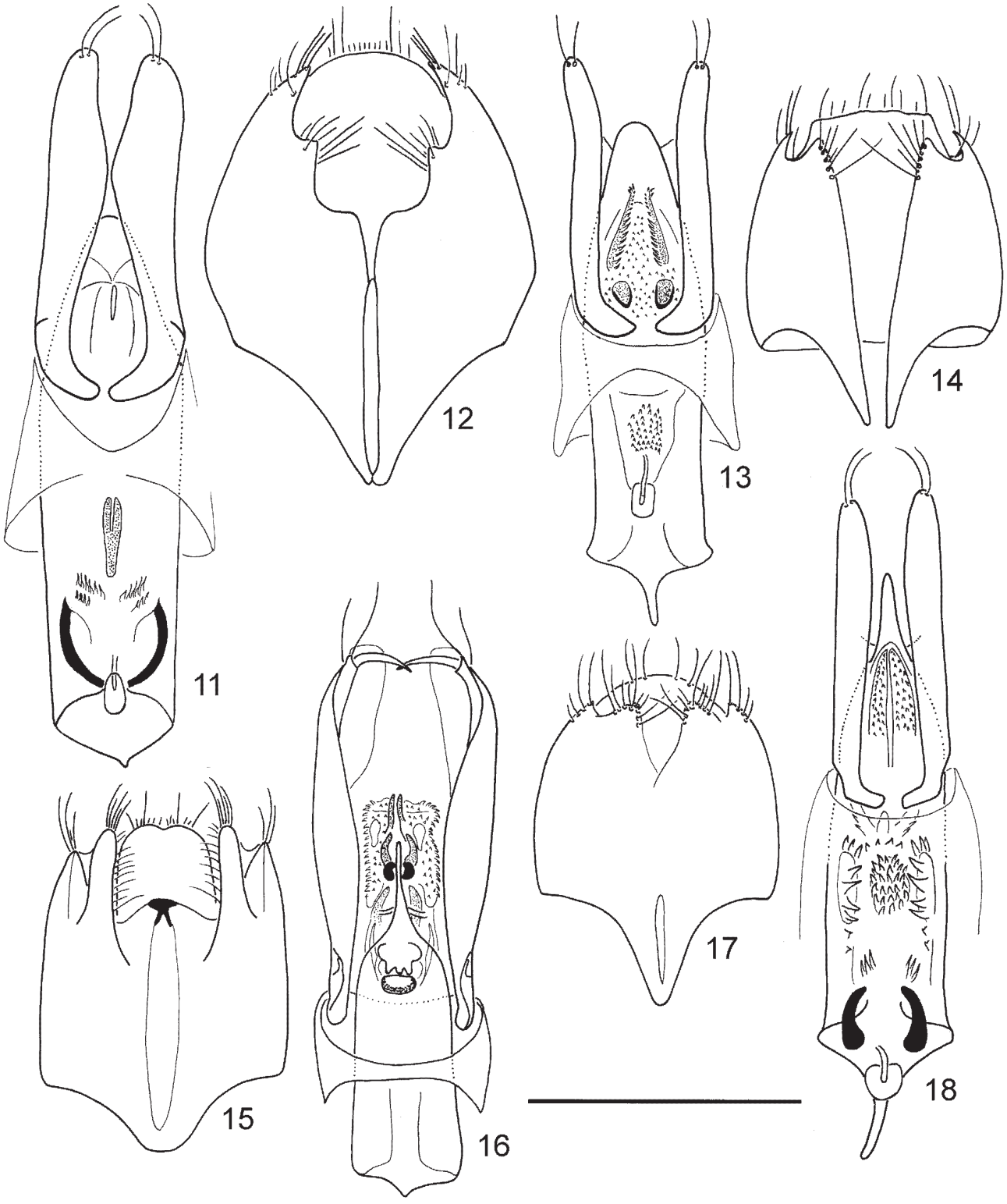


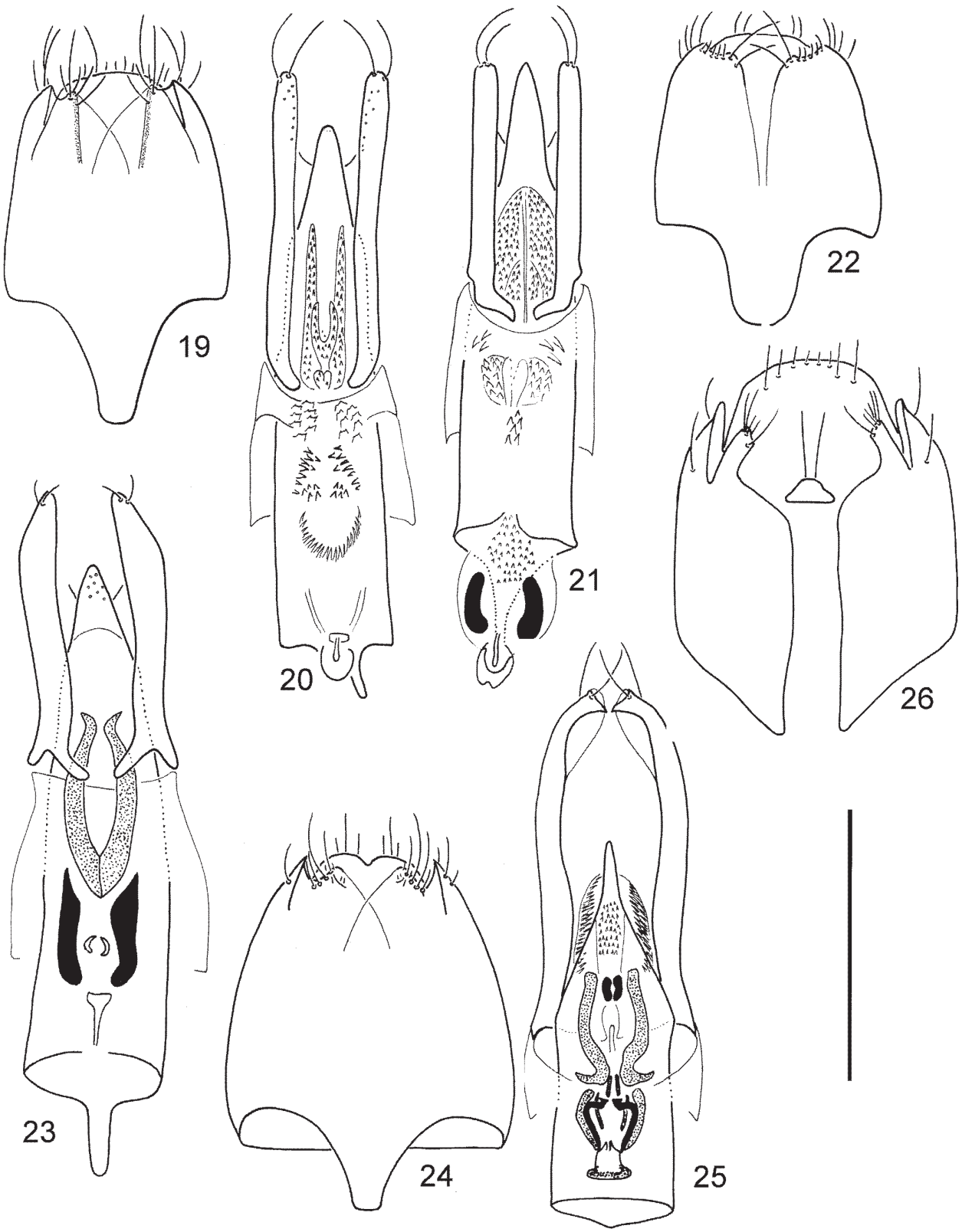
Figure 2. Map of the states of Mexico.



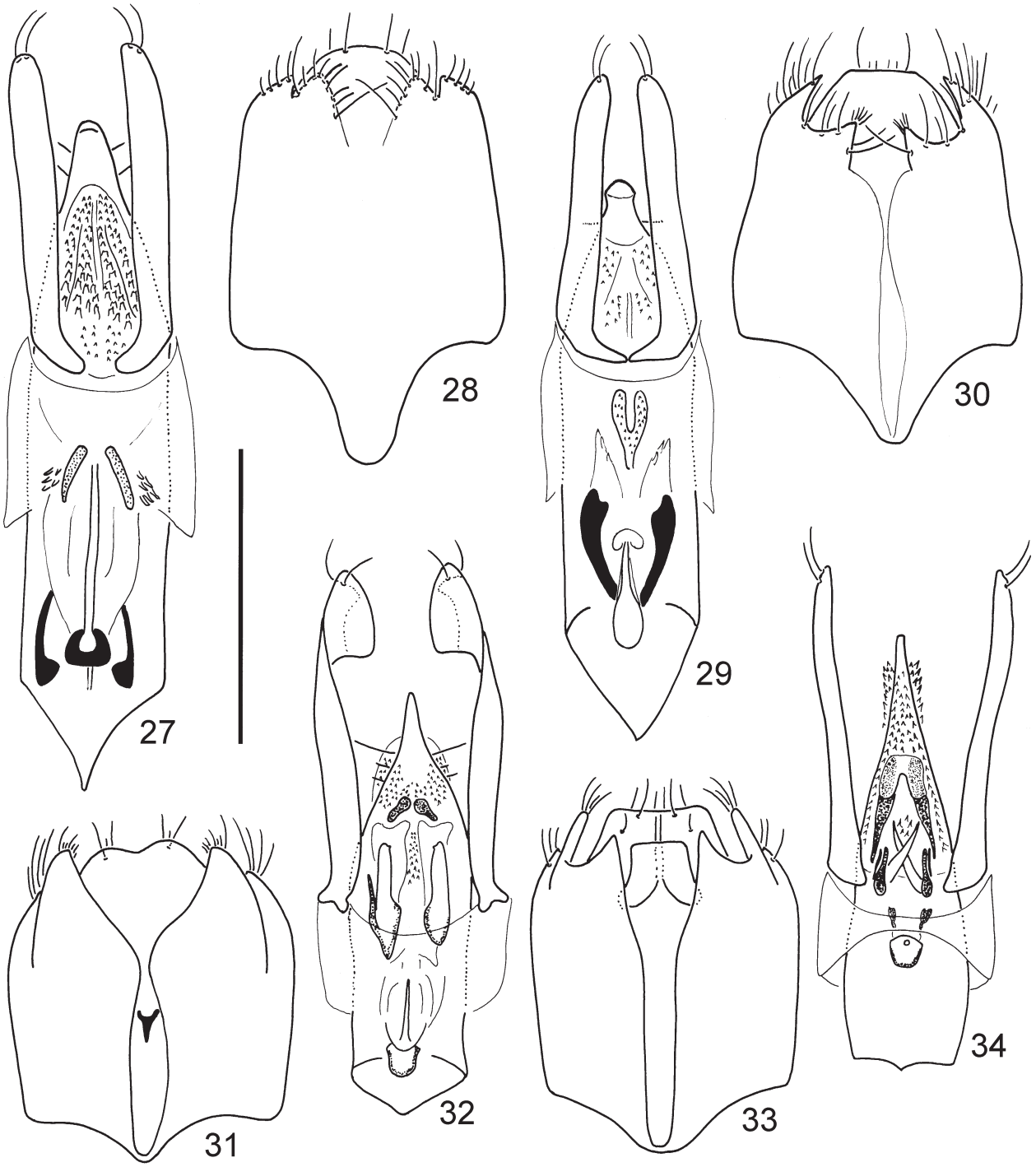
Figures 3–10. Male genitalic structures of *Dissochaetus*. 3) Aedeagus, dorsal, with inverted internal sac, of *D. hetschkoi*. 4) Genital segment, ventral, of *D. hetschkoi*. 5) Aedeagus, dorsal, with inverted internal sac, of *D. obscurus*. 6) Genital segment, ventral, of *D. obscurus*. 7) Genital segment, ventral, of *D. mexicanus*. 8) Aedeagus, dorsal, with inverted internal sac, of *D. mexicanus*. 9) Genital segment, ventral, of *D. aztecus*. 10) Aedeagus, dorsal, with inverted internal sac, of *D. aztecus.* Scale line = 0.35 mm.



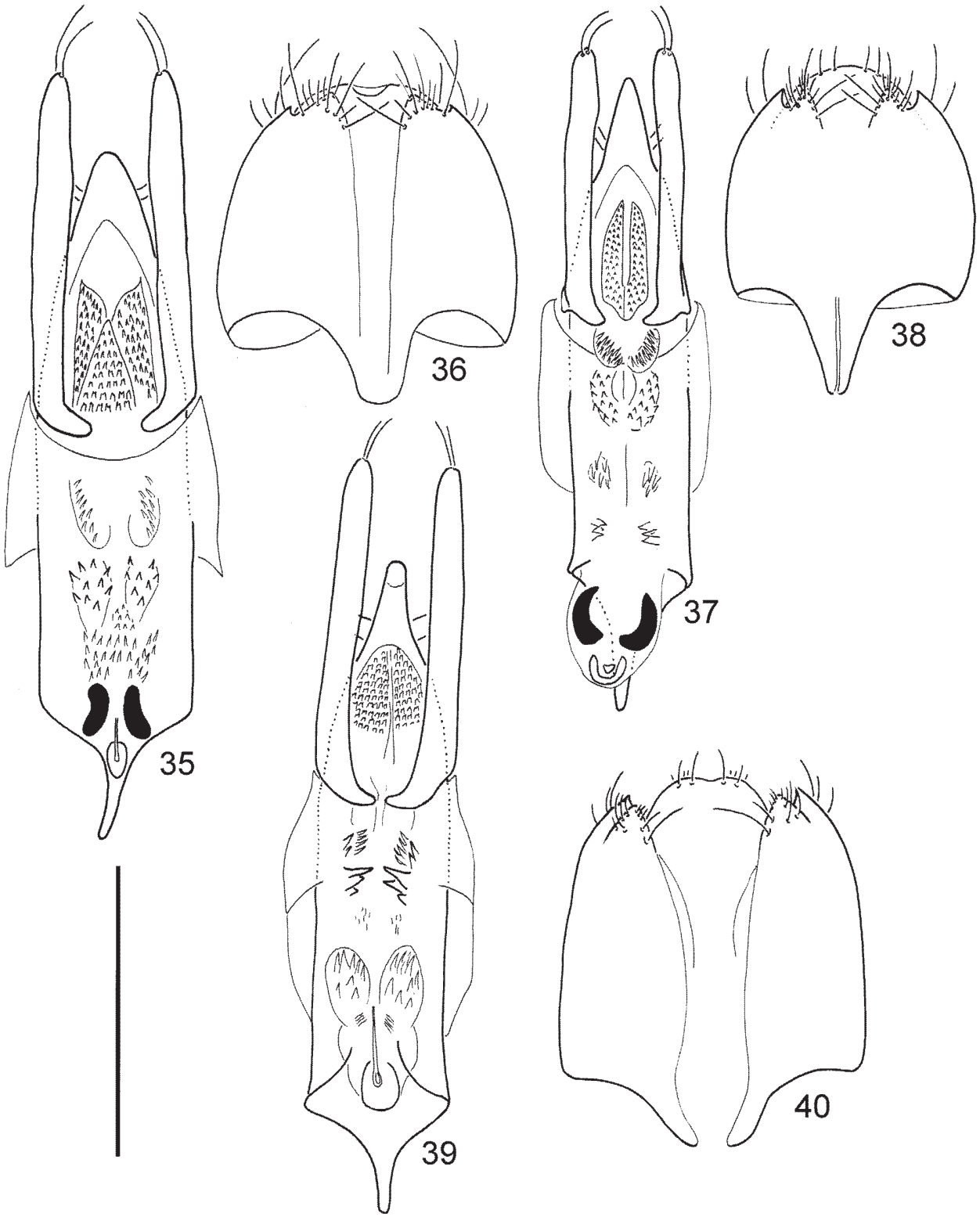
Figures 11–18. Male genitalic structures of *Dissochaetus*. 11) Aedeagus, dorsal, with inverted internal sac, of *D. navarretei.* 12) Genital segment, ventral, of *D. navarretei*. 13) Aedeagus, dorsal, with inverted internal sac, of *D. costaricensis*. 14) Genital segment, ventral, of *D. costaricensis*. 15) Genital segment, ventral, of *D. acanthus*. 16) Aedeagus, dorsal, with partly everted internal sac, of *D. acanthus.* 17) Genital segment, ventral, of *D. angustiformis*. 18) Aedeagus, dorsal, with inverted internal sac, of *D. angustiformis.* Scale line = 0.35 mm.



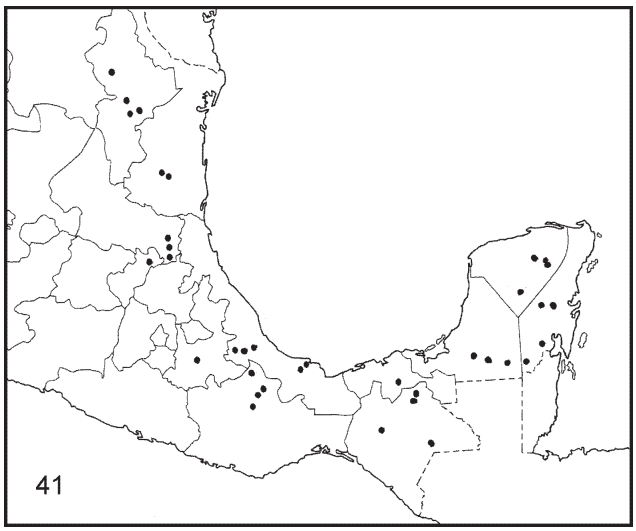
Figures 19–26. Male genitalic structures of *Dissochaetus*. 19) Genital segment, ventral, of *D. bifurcus*. 20) Aedeagus, dorsal, with inverted internal sac, of *D. bifurcus*. 21) Aedeagus, dorsal, with inverted internal sac, of *D. brevis*. 22) Genital segment, ventral, of *D. brevis*. 23) Aedeagus, dorsal, with inverted internal sac, of *D. claviformis*. 24) Genital segment, ventral, of *D. claviformis*. 25) Aedeagus, dorsal, with inverted internal sac, of *D. chiapensis.* 26) Genital segment, ventral, of *D. chiapensis*. Scale line = 0.35 mm.

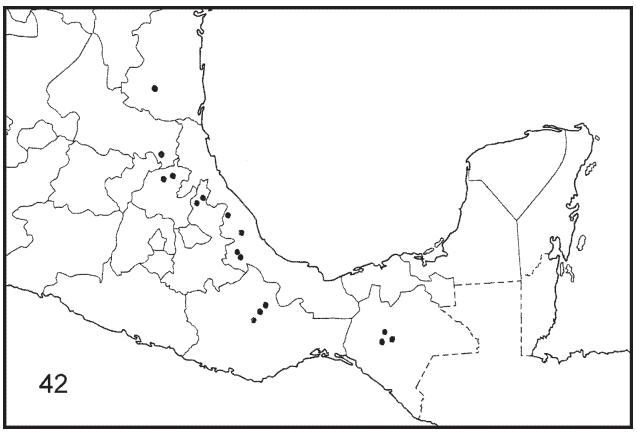


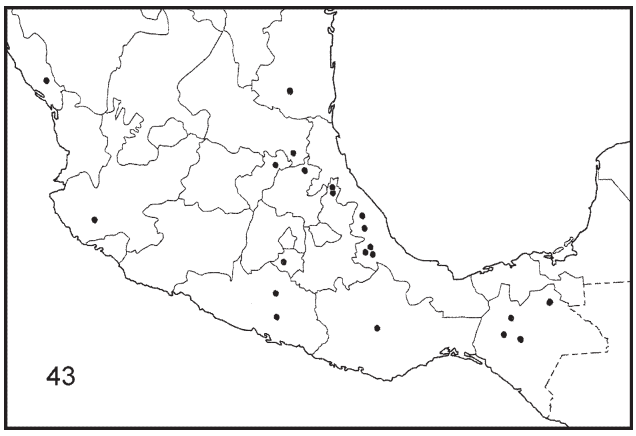
Figures 27–34. Male genitalic structures of *Dissochaetus*. 27) Aedeagus, dorsal, with inverted internal sac, of *D. cristobalensis.* 28) Genital segment, ventral, of *D. cristobalensis*. 29) Aedeagus, dorsal, with inverted internal sac, of *D. lobatus*. 30) Genital segment, ventral, of *D. lobatus*. 31) Genital segment, ventral, of *D. newtoni*. 32) Aedeagus, dorsal, with inverted internal sac, of *D. newtoni*. 33) Genital segment, ventral, of *D. ocozocoautla*. 34) Aedeagus, dorsal, with inverted internal sac, of *D. ocozocoautla.* Scale line = 0.35 mm, Fig. 27–32; 0.30 mm.

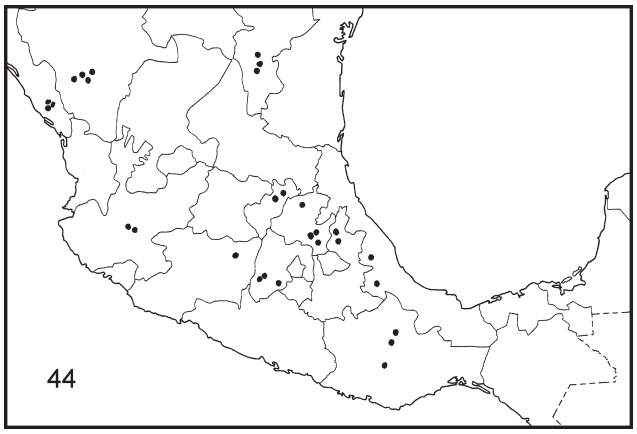


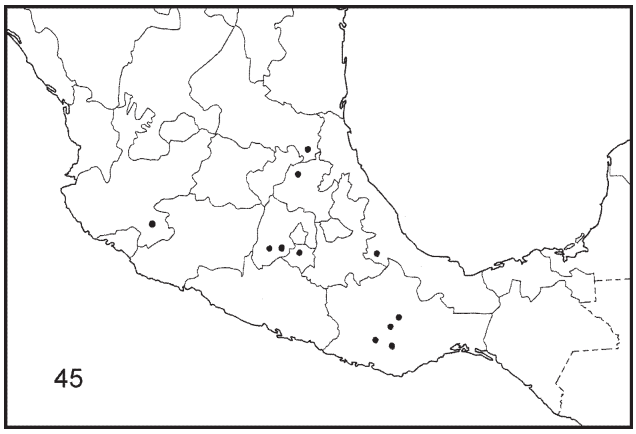
Figures 35–40. Male genitalic structures of *Dissochaetus*. 35) Aedeagus, dorsal, with inverted internal sac, of *D. reniformis*. 36) Genital segment, ventral, of *D. reniformis*. 37) Aedeagus, dorsal, with inverted internal sac, of *D. sinuosus*. 38) Genital segment, ventral, of *D. sinuosis*. 39) Aedeagus, dorsal, with inverted internal sac, of *D. texanus*. 40) Genital segment, ventral, of *D. texanus*. Scale line = 0.35 mm.











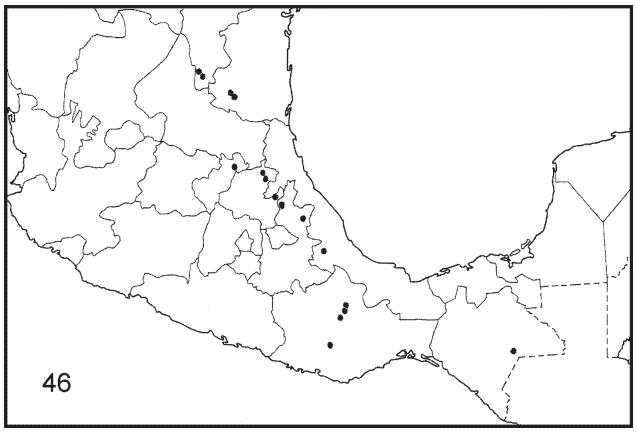


Figure 41. Distribution of *Dissochaetus hetschkoi* (●) in Mexico. Figure 42. Distribution of *Dissochaetus obscurus* (●) in Mexico. Figure 43. Distribution of *Dissochaetus mexicanus* (●) in Mexico. Figure 44. Distribution of *Dissochaetus aztecus* (●) in Mexico. Figure 45. Distribution of *Dissochaetus navarretei* (●) in Mexico. Figure 46. Distribution of *Dissochaetus costaricensis* (●) in Mexico.

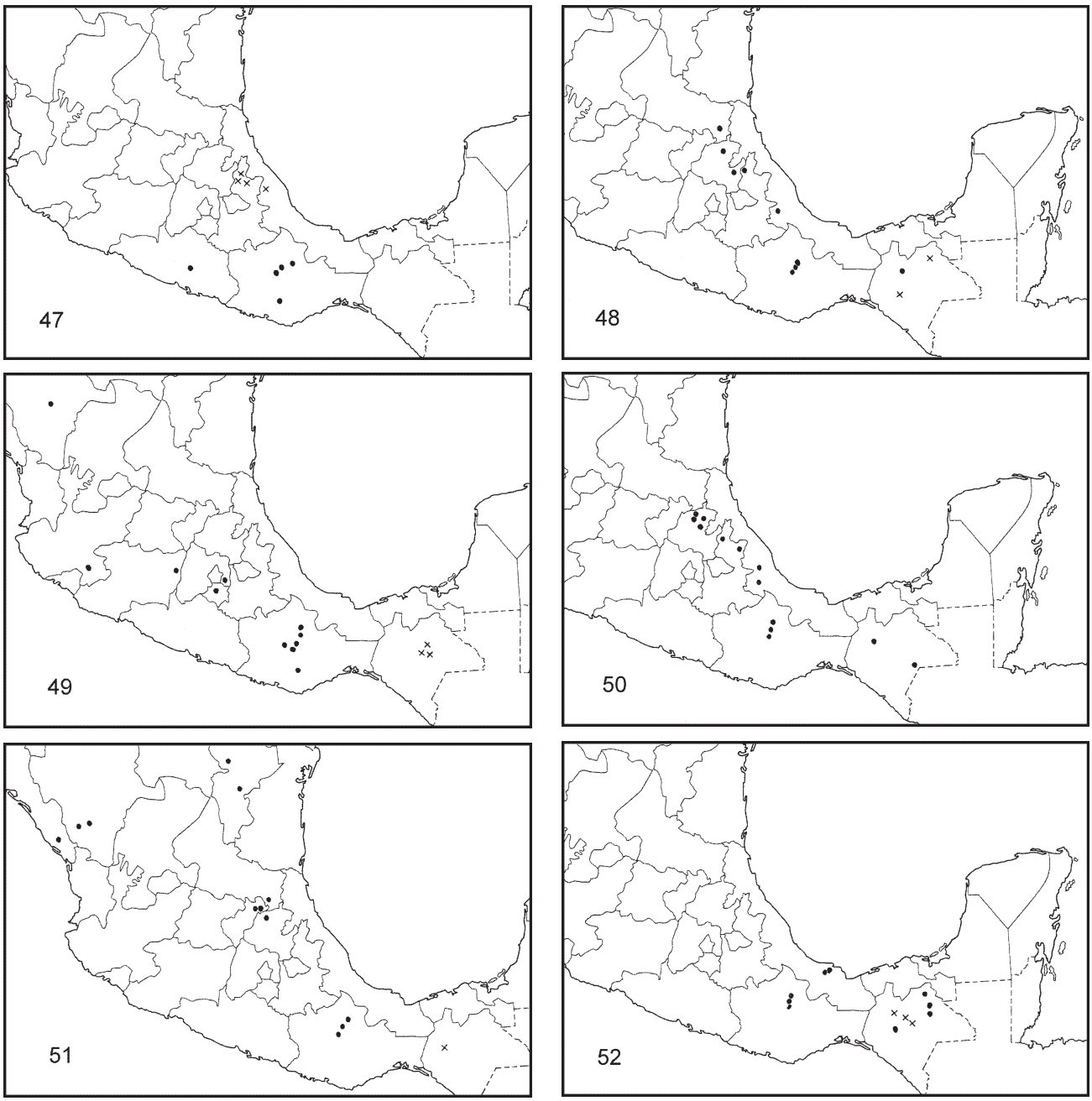


Figure 47. Distribution of *Dissochaetus acanthus* (x) and *D. angustiformis* (●) in Mexico. Figure 48. Distribution of *Dissochaetus bifurcus* (●) and *D. chiapensis* (x) in Mexico. Figure 49. Distribution of *Dissochaetus brevis* (●) and *D. cristobalensis* (x) in Mexico. Figure 50. Distribution of *Dissochaetus claviformis* (●) in Mexico. Figure 51. Distribution of *Dissochaetus lobatus* (●) and *D. ocozocoautla* (x) in Mexico. Figure 52. Distribution of *Dissochaetus newtoni* (●) and *D. reniformis* (x) in Mexico.

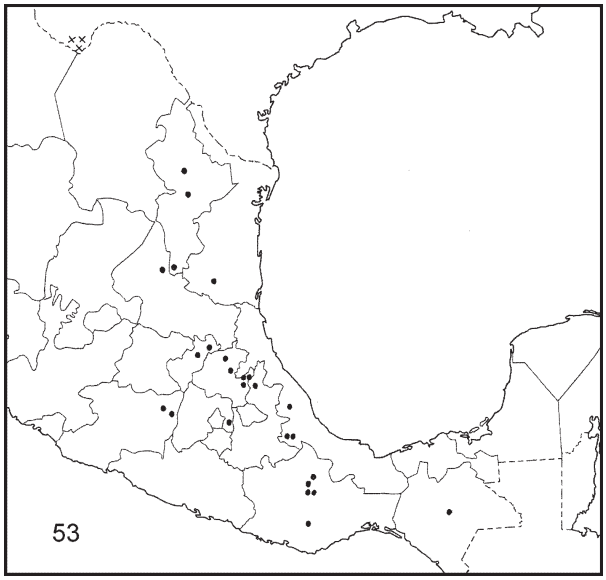


Figure 53. Distribution of *Dissochaetus sinuosus* (●) in Mexico and *D. texanus* (x) in the United States.