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THE NEARCTIC SPECIES OF THE FAMILY
STEPHANIDAE (HYMENOPTERA)

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THE Stephanidae are a family of relatively large, elongate parasitic Hymenoptera usually regarded as rare, but sometimes common in the Tropics. They have a spherical head, long neck, stalked abdomen, long hind coxa, swollen hind femur, and long ovipositor: characters that together give an appearance unlike any other insects except certain groups of Braconidae. In these features (except the ovipositor length) the primitive genus *Schlettererius* is conservative, and the more specialized genera progressively more extreme.

The family may be at once distinguished by habitus (pl. 25, figs. 1, 2) and the crown of five blunt to acute teeth surrounding the median ocellus of all species. The multisegmented antenna, the wing venation, and other structural features suggest close relation to the Braconidae. The crown of teeth on the head, shape of the mandible, venation, and some other features are reminiscent of the Orussidae.

Stephanids are often collected on dead tree trunks. Because of this and their habitus, the species are generally presumed to be parasites of wood-boring Coleoptera. Other possible hosts are aculeate Hymenoptera nesting in wood. The only known rearing record is of a short series of *Diastephanus leucostictus* in the United States National Museum, from *Agrilus kalshoveni* in Java. The adults are sluggish and awkward in walking and slow in flight.

Two genera containing six species are known from America north of Mexico. The types of the described species have been studied, except for these of the names *Stephanus bicolor* Westwood and *S. sickmanni* Schletterer. Most of the specimens studied are in the

United States National Museum at Washington, D. C. The locations of specimens in institutional collections are indicated (in parentheses) by the name of the city in which they are stored or, in private collections, by the name of the owner.

KEY TO THE NEARCTIC GENERA OF STEPHANIDAE

- First abdominal tergite about 2.5 as long as wide, not fused with its sternite; hind wing with nervellus; hind femur with three larger teeth beneath; hind tarsus of female with five segments; eighth tergite of female with a median apical point. (See pl. 25, fig. 1)-----Schlettererius
- First abdominal tergite at least 4.0 as long as wide, fused with its sternite; hind wing without nervellus; hind femur with two larger teeth beneath (apical tooth often subdivided); hind tarsus of female with three segments; eighth tergite of female (of Nearctic species) without a median apical point. (See pl. 25, fig. 2)-----Megischus

Genus SCHLETTERERIUS Ashmead

PLATE 25, FIGURE 1

Schlettererius ASHMEAD, Proc. U. S. Nat. Mus., vol. 23, p. 20, 1900. Type: *Stephanus cinctipes* Cresson. Monobasic.

The free first abdominal sternite and exceptionally complete venation mark this genus as the most primitive of the family. The 5-segmented hind tarsus of the female, three teeth on the under side of the hind femur, and several venational features indicate rather close relation to *Stephanus*, a monotypic genus of Europe.

Schlettererius contains only the species below. *Stephanus rufipes* Say has been referred to *Schlettererius*, but it belongs in the Braconidae, as evidenced by the following characters in Say's description: Abdomen sessile, the petiole not visible; thorax not remarkably attenuate before; propodeum with two slightly elevated, longitudinal, distant lines; stigma large, triangular, and fuscous; length 5 mm. Say placed the species in *Stephanus* largely on similarity of wing venation with Jurine's figure of *Stephanus serrator*. It has never been correctly identified since it was first described.

SCHLETTERERIUS CINCTIPES (Cresson)

PLATE 25, FIGURE 1

Stephanus cinctipes CRESSON, Trans. Amer. Ent. Soc., vol. 8, proc. xviii, 1880. Type: ♀, Washington Territory (Philadelphia).

Forewing of male 8-13 mm. long, of female 8-16 mm. long; ovipositor sheath about 2.0 as long as the body. Easily distinguished by the characters pointed out in the key to genera. See plate 25, figure 1 for an illustration.

Black. Second and third abdominal segments, first abdominal segment except more or less of its base, and sometimes the fourth abdominal segment of male basally, ferruginous; labrum, ventrolateral triangles on frons of male, basal 0.15 to 0.3 of tibiae, apices of front and middle femora, and a very broad subapical band on ovipositor sheath white; tegula brown; extreme base of wing white; forewing light brown beyond the basal vein, with a narrow hyaline band diagonally across the discal cell and across the base of the second discoidal cell; apical 0.5 of hind wing light brown; tarsi whitish to light brown, darkest apically.

Specimens.—9 ♂, 21 ♀, from ARIZONA (Cochise County); BRITISH COLUMBIA (Pender Harbor, Robson, and Vancouver); CALIFORNIA (Alta, Bass Lake, Cisco, Fallen Leaf Lake in El Dorado County, McCloud, Meyers, Pinecrest, Porterville, Riverton in El Dorado County, and Yreka); IDAHO (Coeur d'Alene); OREGON (at 6,500 feet on Antelope Mountain in Harney County, and Ashland); and WASHINGTON (Ashford, Mount Rainier, and Kooskooskie in Walla Walla County). Dates of collection run from June 1 to August 29.

This species has about the same range as *Pseudotsuga taxifolia* (Douglas fir) and seems to be most common in forests of this tree.

Genus MEGISCHUS Brullé

PLATE 25, FIGURE 2

Megischus BRULLÉ, Histoire naturelle des insectes, Hyménoptères, vol. 4, p. 537, 1846. Type: (*Megischus annulator* Brullé) = *fureatus* Lepelletier and Serville. Designated by Viereck, 1914.

Bothriocerus SICHEL, Ann. Soc. Ent. France, ser. 3, vol. 8, p. 759, 1860. Type: *Bothriocerus europocus* Sichel. Designated by Viereck, 1914.

Hemistephanus ENDERLEIN, Stettin. Ent. Zeit., vol. 67, p. 301, 1906. Type: *Stephanus macrurus* Schletterer. Original designation.

Megischus is a pantropic genus containing about 60 described species, but at least 20 of these appear to be synonyms. Most of the species now stand in literature under the generic name *Stephanus*. *Megischus* differs most conspicuously from *Stephanus* and *Schlettererius* in having only three segments in the female hind tarsus, and from all other genera in the family in its more complete venation.

Five Nearctic species are included, divisible into three species groups as indicated in the key to species.

KEY TO THE NEARCTIC SPECIES OF MEGISCHUS

1. First tergite mat, smooth; pronotum mat (*texanus* group)----- 2
- First tergite polished and with conspicuous transverse wrinkles (pl. 25, fig. 2); pronotum polished----- 3

2. Posterior half of pronotum mat and with fine transverse striation (pl. 25, fig. 3); mesopleurum mat and rugulose; brachial vein distinct; body dark brown..... 1. *californicus*, new species
 Posterior half of pronotum mat, not striate (pl. 25, fig. 4); mesopleurum mat and with large shallow punctures; brachial vein subobsolete; body light brown..... 2. *texanus* Cresson
3. Outer face of hind femur mat; pronotum, as seen from above, with a deep subapical notch on each side, and with a weak subbasal swelling (pl. 25, fig. 5); inner edge of hind femur of female with a weak submedian indentation (*bicolor* group)..... 4
 Outer face of hind femur polished; pronotum, as seen from above, without a deep subapical notch on each side, and with a strong subbasal swelling (pl. 25, figs. 6, 7); inner edge of hind tibia of female with a strong, almost semicircular indentation (*brunneus* group)..... 5
4. Head and pronotum blackish..... 3a. *bicolor sickmanni* (Schletterer)
 Head and pronotum ferruginous..... 3b. *bicolor bicolor* (Westwood)
5. Ovipositor sheath with a subapical white band; pronotum sculptured as in pl. 25, fig. 6, with a subapical pair of short ridges on each side; lower half of temple with scattered weak or obsolescent punctures.
 4. *arizonicus*, new species
 Ovipositor sheath without a white subapical band; pronotum sculptured as in pl. 25, fig. 7, with a subapical set of about four sharp cross ridges; temple with coarse punctures next to the eye, or these punctures weak or absent.
 5. *brunneus* Cresson

1. *MEGISCHUS CALIFORNICUS*, new species

PLATE 25, FIGURE 3

Mesopleurum rugulose.

Forewing of males about 5 mm. long, of females 5.5–6.5 mm. long; temple rugulose in its lower $0.6 \pm$ and in its upper $0.15 \pm$, the rest polished; pronotum mat, the front 0.3 with cross ridges, the rest with fine cross striae (pl. 25, fig. 3), which are often obsolescent in smaller specimens; mesopleurum and propodeum rugulose; brachial and subdiscoidal veins weak but distinct; outer face of hind femur mat, apically somewhat rugulose; hind tibia of female pinched laterally at its basal 0.35, most strongly indented on its outer side, beyond the pinch swollen to the width of the hind femur, its inner edge without a noticeable median indentation; hind basitarsus of female narrow, not expanded apically; first tergite mat and somewhat rugulose, in the female about 5.5 as long as wide; ovipositor sheath about 1.15 as long as the body.

Dark brown to blackish, with the antenna and legs a little paler. Cheek mostly pale brown; wings lightly infusate; ovipositor sheath with a subapical white band.

Type.—♀, U.S.N.M. No. 58647, Los Angeles County, Calif., D. W. Coquillett (Washington).

Paratypes.—CALIFORNIA: ♀, Carville, Trinity County, 2,400–2,500 feet, June 3, 1934 (Townes). ♀, Greenhorn Mountains, Tulare

County, May 7, 1931, E. C. Van Dyke (San Francisco). ♂, Mount Diablo, Contra Costa County, June 25, 1939, E. C. Van Dyke (San Francisco). ♂, Mount Wilson, 5,000 feet, May 26, 1918, J. O. Martin (San Francisco). ♂, Piñon Flat, Santa Rosa Mountains, May 27, 1941, D. J. and J. N. Knull (Washington). 11 ♂, Santa Rosa Mountains, May 27 to July 4, 1946, D. J. and J. N. Knull (Columbus and Townes). ♀, Switzer's Camp, San Gabriel Mountains, June 1927 (Cambridge).

2. MEGISCHUS TEXANUS Cresson

PLATE 25, FIGURE 4

Megischus texanus CRESSON, Trans. Amer. Ent. Soc., vol. 4, p. 190, 1872. Type: ♀, Comal County, Tex. (Philadelphia).

Mesopleurum mat and sparsely punctate; body light brown.

Forewing of males 4–5 mm. long, of females 5–8 mm. long; temple with a few weak punctures, weakly mat in its lower $0.6 \pm$ and in its upper $0.15 \pm$, the rest polished; pronotum mat, its anterior 0.3 to 0.4 with cross ridges (pl. 25, fig. 4); mesopleurum mat, with sparse large shallow punctures; propodeum mat, its central part, especially apically, more or less punctate to punctato-rugose; brachial and subdiscoidal veins subobsolete; outer face of hind femur with a few shallow punctures, mat, most strongly mat toward its apex; hind tibia of female pinched laterally at its basal 0.35 , most strongly indented on the outer side, beyond the pinch swollen to the width of the femur, its inner edge without a noticeable median indentation; hind basitarsus of female narrow, not expanded apically; first tergite mat, smooth, in the female about 7.0 as long as wide; ovipositor sheath about 0.9 as long as the body.

Light brown. Wings tinged with brown; tergites 2–5 with a more or less distinct darker brown apical band, and the apical part of the abdomen often darker brown than the rest of the body; ovipositor sheath with a subapical white band.

Specimens.—ARIZONA: ♀, Chiricahua Mountains, June 3, 1935, J. N. Knull (Washington). ♀, Douglas, April 13, 1939, W. W. Jones (Washington). ♂, Huachuca Mountains, June 11, 1933, R. H. Beamer (Lawrence). ♂, Huachuca Mountains (Washington). ♀, Prescott, May 19, Barber and Schwarz (Washington). ♂, Tucson, July 20, 1940, D. J. and J. N. Knull (Washington). ♀, Sunnyside Canyon, Huachuca Mountains, July 9, 1940, R. H. Beamer (Lawrence). ♀, southern Arizona (Cambridge).

CALIFORNIA: ♂, 2 ♀, Santa Rosa Mountains, July 4, 1946, D. J. and J. N. Knull (Columbus and Townes).

MEXICO: ♀, Nogales, Sonora, June 25, 1942 (Washington).

OKLAHOMA: ♂, Wichita National Forest, June 26, 1936, R. H. Beamer (Lawrence).

TEXAS: ♂, Brownwood, August 23, 1921, R. H. Painter (New York).
♂, Chisos Mountains, July 17, 1946, D. J. and J. N. Knull (Columbus).
♀, College Station, September 30, 1936 (Townes). ♀, Davis Mountains, July 2, 1940, D. J. and J. N. Knull (Washington). 2♂, 1♀, Eastland County, April 4, May 9, and June 10, 1941, Grace O. Wiley (Columbus). ♀, Gillespie County, May 2, 1935, J. N. Knull (Washington). ♂, ♀, Gillespie County, May 7, 1946, D. J. and J. N. Knull (Columbus). ♀, New Braunfels, June 2, 1901 (Cambridge). ♂, Nueces River, July 2, 1917 (Ithaca). ♀, Star County, July 5, 1938, R. H. Beamer (Townes). ♀, Uvalde, June 21 (Washington). ♀, Texas (Washington).

3. *MEGISCHUS BICOLOR* (Westwood), new combination

PLATE 25. FIGURES 2, 5

Pronotum, as seen from above, with a deep subapical notch in each side (pl. 25, fig. 5).

Forewing of males 4.5–8.5 mm. long, of females 6.5–11 mm. long; temple polished, with a few fine punctures; pronotum polished, weakly swollen subbasally, medially and subbasally with irregular coarse cross ridges and subbasally with some large indistinct punctures; pronotum subapically with a large dorsal quadrate impression that connects on each side with a very deep notch (pl. 25, fig. 5); mesopleurum polished, with large round punctures separated by about 0.4 their diameter; brachial and subdiscoidal veins usually distinct, sometimes obsolescent in small specimens; outer face of hind femur mat, subpolished basally; hind tibia of female pinched sharply at its basal 0.4, beyond which it is swollen to 0.8 the width of the hind femur, its inner face somewhat indented at the apical 0.4; hind basitarsus of female rather narrow, weakly expanded apically; first tergite polished, with close interrupted cross ridges, in the female about 9.0 as long as wide; ovipositor sheath about 1.12 as long as the body.

Blackish brown, or sometimes more or less dark ferruginous, the ferruginous most often restricted to the head and fore part of the thorax but sometimes covering the entire body. Cheek mostly stramineous; antenna, hind margin of pronotum, tegula, front and middle legs, hind trochanters, and basal 0.33 of hind tibia usually paler than the ground color, often brownish ferruginous; wings subhyaline; ovipositor sheath with a white preapical band.

This species occurs in mesic woods from Ontario to Florida, west to Iowa, Texas, Arizona, Utah, and southern California. On the basis of color it is divisible into two subspecies, the typical subspecies occupying the Lower Austral and Tropical Zones of the Southeastern States, and the other subspecies the rest of its range.

3a. MEGISCHUS BICOLOR SICKMANNI (Schletterer), new combination

Stephanus sickmanni SCHLETTERER, Berlin. Ent. Zeitschr., vol. 33, p. 152, 1889.

Type: ♀, Georgia (Berlin).

Megischus canadensis DAVIS, Trans. Amer. Ent. Soc., vol. 24, p. 349, 1898. Type:

♀, Toronto, Ontario (Philadelphia). New synonymy.

Head and pronotum brown to blackish.

Specimens.—15 ♂, 26 ♀, from ARIZONA (Chiricahua Mountains and Sabino Canyon); CALIFORNIA (Santa Rosa Mountains); CONNECTICUT (Cornwall); DELAWARE (New Castle County); DISTRICT OF COLUMBIA (Washington); IOWA; KANSAS (Leavenworth County); MARYLAND (Plummers Island and Takoma Park); MASSACHUSETTS (Framingham and Holliston); MICHIGAN (Deerfield Township and Midland County); MISSOURI (Kansas City); NEW JERSEY (Cresskill); NEW YORK (Auburn, Bronxville, Farmingdale, Ithaca, and Wading River on Long Island); NORTH CAROLINA (Hertford County); OHIO (Delaware County and Puritas Spring); PENNSYLVANIA (Glenside and Hummelstown); TEXAS (Austin, Brownsville, Cisco, Dallas, and Sabin); UTAH (Emery County); VIRGINIA (Cape Henry, Falls Church, and Nelson County); and WEST VIRGINIA (West Sulphur). The specimen reported above from Kansas City, Mo., was reported and described by Viereck (Trans. Kansas Acad. Sci., vol. 19, p. 325, 1905) as *Stephanus acutus* of Lepeletier and Serville. The true "*Stephanus*" *acutus* is a Neotropical species.

Adults are on the wing through the summer and are most commonly taken in July and August. Some early and late dates of collection are April 25 at Dallas, Tex., June 6 at Plummers Island, Md., and September 10 at Cape Henry, Va. An adult was reared from *Quercus bicolor* at Hummelstown, Pa., by J. N. Knull, and one taken on dead *Populus grandidentata* at Ithaca, N. Y., by W. W. Middlekauff. I took a short series on a standing dead beech (*Fagus grandifolia*) at Takoma Park, Md. The tree had been dead about 4 years, and the bark was beginning to fall off but most of it still adhered tightly. On the bark of the trunk the stephanid looked much like a *Xorides* (Ichneumonidae), but one male and one female were seen with the head and fore part of the thorax raised high from the trunk and the hind legs spread wide apart. In the case of the female the hind legs were closely applied to the bark. The male in this position was cleaning its antennae. When a net was put near a specimen on the trunk, it would walk away backward and would be slow to take flight. Flight, walking, and other movements were all sluggish.

3b. MEGISCHUS BICOLOR BICOLOR (Westwood), new combination

Stephanus bicolor WESTWOOD, Ann. Nat. Hist., vol. 7, p. 538, 1841. Type: ♀, Georgia (Linnaean Soc., London).

Stephanus bicolor WESTWOOD, Trans. Ent. Soc. London, ser. 1, vol. 3, p. 276, 1843.

Further description.

Megischus floridanus DAVIS, Trans. Amer. Ent. Soc., vol. 24, p. 349, 1898. Type: ♀, Florida (Philadelphia). New synonymy.

Head and pronotum, and often more of the body ferruginous.

Specimens.—FLORIDA: ♀, Biscayne Bay, A. T. Slosson (New York). ♀, Elliotts Key (Washington). ♂, Enterprise (Washington). ♀, Fort George, June 1883 (Washington). 3 ♀, Hilliard, August 19, 1930, J. Nottingham and R. H. Beamer (Lawrence and Townes). ♀, Key West, November 1945, H. L. Black (Washington). ♀, Long Pine Key, March, Clench and Schevill (Cambridge). ♀, Miami, August 27, 1933, Frank N. Young (Gainesville). ♀, Miami Beach, April 18, 1918, T. E. Snyder (Washington). ♂, Paradise Key, February 27, 1919, E. A. Schwarz (Washington). ♀, Plymouth, February 20, 1918, G. G. Ainslie (Washington). ♀, Florida (Washington).

LOUISIANA: ♀, Ruston, October 10, 1908, H. S. Smith (Washington).

SOUTH CAROLINA: ♀, Charleston, May 24, 1934, J. C. Watts (Townes).

NO DATA: ♀ (Washington).

4. MEGISCHUS ARIZONICUS, new species

PLATE 25, FIGURE 6

Pronotum polished, strongly swollen subbasally, anteriorly with a pair of high sharp carinae on each side (pl. 25, fig. 6).

Type female: Forewing 12.5 mm. long; temple polished, its lower 0.5 with sparse large shallow punctures; pronotum polished, with a strong subbasal swelling that bears a few punctures, medially very coarsely rugose, and apically with a strongly impressed area bordered on each side by two sharp oblique ridges (pl. 25, fig. 6); mesopleurum polished, with scattered large deep punctures separated by 1.0 or more their diameter; propodeum polished, coarsely rugoso-punctate; brachial and subdiscoidal veins distinct; outer face of hind femur polished, with a few shallow punctures; hind tibia sharply pinched near the middle, just beyond which on each side is a blunt transverse ridge and on the inner face an almost semicircular dip; apical half of hind tibia swollen to about 0.7 the width of the hind femur; hind basitarsus 4.7 as long as wide, a little expanded apically; first tergite 4.5 as long as wide, polished, and with rather close cross ridges; ovipositor sheath 1.1 as long as the body.

Piceous. Cheek mostly stramineous; top half of head tinged with ferruginous; hind margin and hind corner of pronotum, tegula, knees, trochanters, tarsi (the front tarsi missing), and propodeum except

laterally, dark ferruginous; wing weakly infumate, the forewing marked with brown along the veins near the outer end of the brachial cell; abdomen ferruginous basally, shading to dark ferruginous apically; ovipositor sheath with a preapical white band.

Paratype male: Similar to the type female but smaller (forewing 6.5 mm. long) and with weaker sculpture and the punctures less regularly formed. The punctures on the lower 0.5 of the temple are almost obsolete, and the pair of high sharp carinae on each side of the front end of the pronotum are almost transverse rather than strongly oblique. The first tergite is 10 times as long as wide and almost smooth.

Type.—♀, U.S.N.M. No. 58648, on white oak, Bear Canyon, Catalina Mountains, Ariz., M. Chrisman (Washington).

Paratype.—♂, San Domingo, Baja California, July 19, 1938, Michelbacher and Ross (San Francisco).

5. MEGISCHUS BRUNNEUS Cresson

PLATE 25, FIGURE 7

Megischus brunneus CRESSON, Proc. Ent. Soc. Philadelphia, vol. 4, p. 84, 1865,
Type: ♀, Cuba (Philadelphia).

Pronotum polished, anteriorly with about four sharp high cross carinae (pl. 25, fig. 7); ovipositor sheath without a subapical white band.

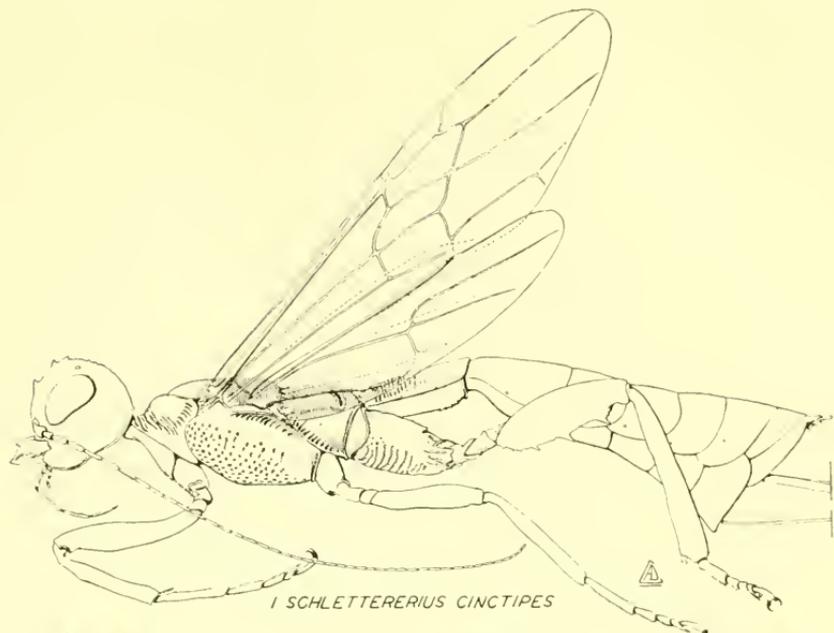
Forewing of male 8 mm. long, of female 9–16 mm. long; temple polished, in larger specimens with large irregular punctures behind the eye; pronotum polished, subbasally with a strong swelling that bears coarse irregular punctures, medially with a raised transverse area that is coarsely rugoso-punctate, and apically with about four high sharp transverse carinae, some of which are usually interrupted medially (pl. 25, fig. 7); mesopleurum polished, with large round punctures separated by about 0.7 their diameter; propodeum polished, with rather close large round punctures; brachial and subdiscoidal veins distinct; outer face of hind femur polished, with a very few fine shallow punctures; hind tibia of female sharply pinched at its basal 0.35, just beyond this with a sharp rounded dip in its anterior face; apical half of female hind tibia swollen to the width of the hind femur; hind basitarsus of female about 3.0 as long as wide, strongly expanded apically; first tergite polished, with rather coarse cross ridges, in the female about 6.0 as long as wide; ovipositor sheath about 1.1 as long as the body.

Piceous. Cheek mostly stramineous; hind margin and hind corner of pronotum, tegula, sometimes the propodeum, front and middle legs, trochanters, basal part of hind tibia, hind tarsus, and basal part of

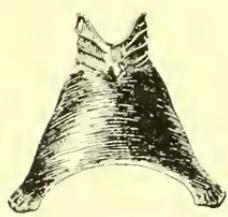
first tergite usually more or less stained with ferruginous; wings weakly infumate, the forewing marked with brown along the veins near the outer end of the brachial cell; ovipositor sheath uniformly blackish.

Specimens.—CUBA: ♂, 2 ♀, taken on trees, Central Jaronú, November 10, 1930, L. C. Scaramuzza (Washington). ♀, Taco Taco, April 1-6, 1922, S. C. Bruner, J. Acuña, and C. H. Ballou (Washington).

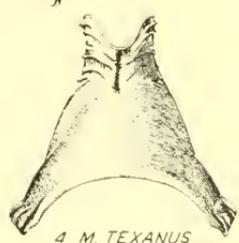
FLORIDA: ♀, on buttonwood, Cape Sable, February 28, 1940, C. F. Rainwater (Washington). ♀, Miami, August 1, 1938 (St. Paul).



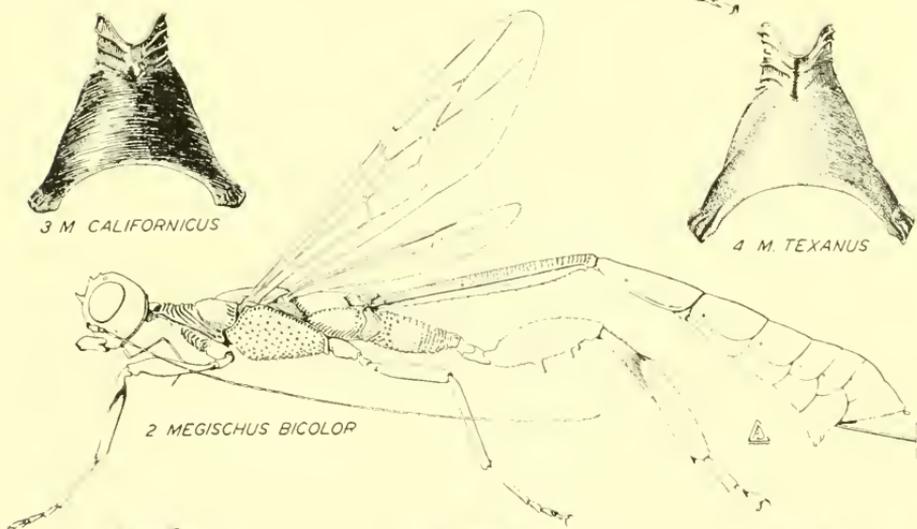
1 SCHLETTERERIUS CINCTIPES



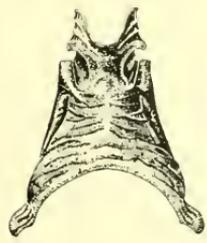
3 M. CALIFORNICUS



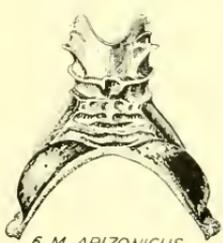
4 M. TEXANUS



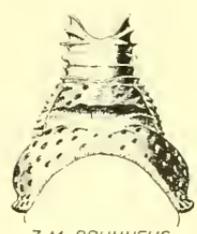
2 MEGISCHUS BICOLOR



5 M. BICOLOR



6 M. ARIZONICUS



7 M. BRUNNEUS

1. *Schlettererius cinctipes* (Cresson); 2, 5. *Megischus bicolor* (Westwood); 3, *M. californicus*, new species; 4, *M. texanus* Cresson; 6, *M. arizonicus*, new species; 7, *M. brunneus* Cresson.

