
Las opiniones expresadas por los autores no necesariamente reflejan la postura del editor de la publicación.

Queda estrictamente prohibida la reproducción total o parcial de los contenidos e imágenes de la publicación sin previa autorización de la Universidad de Guadalajara.
Review of the New World Tigava Lace Bug Complex (Hemiptera: Heteroptera: Tingidae), with the Description of Two New Genera and Two New Species and a Key to Genera

Revisión del complejo de géneros de chinches de encaje del Nuevo Mundo Tigava (Hemiptera: Heteroptera: Tingidae), con la descripción de dos nuevos géneros y dos nuevas especies y una clave para géneros

Thomas J. Henry¹, Sara I. Montemayor², and Alexander H. Knudson³

¹Systematic Entomology Laboratory, Agricultural Research Service, United States Department of Agriculture, c/o National Museum of Natural History, MRC-168, Smithsonian Institution, Washington, D. C. 20013-7013, thomas.henry@ars.usda.gov; ²Universidad Nacional de La Plata, CONICET, División Entomología, Museo de La Plata, Paseo del Bosque s/n B1900FWA, La Plata, Buenos Aires, Argentina, smontemay@f cynm.unlp.edu.ar; ³Department of Entomology, North Dakota State University, 1300 Albrecht Blvd., 202 Hultz Hall, Fargo, North Dakota 58102, alexander.kudson.2@ndsu.edu

Corresponding author

ABSTRACT
The lace bug (Tingidae) genera belonging to the New World Tigava complex are reviewed. The two new genera and new species Mexicotingis brailovskyi, from México, and Paraceratotingis convergens, from Venezuela, are described. Diagnoses, descriptions, and digital photographs of the new taxa, diagnoses and digital photographs of the heads and pronota of all genera, an updated checklist and distributions of the included species, and a key to genera are provided to help distinguish these closely related Tingidae.

Key words: Insecta, Neotropical, new genera, new species, checklist, distribution, key.

RESUMEN
Se revisan los géneros de chinches de encaje (Tingidae) del Nuevo Mundo pertenecientes al complejo Tigava. Se describen dos nuevos géneros y especies Mexicotingis brailovskyi de México, y Paraceratotingis convergens, de Venezuela. Se brindan diagnósticos, descripciones, y fotos en color de los nuevos taxon, diagnósticos y fotografías de la cabeza y el pronoto de todos los géneros, una lista actualizada de las distribuciones de todas sus especies, y una clave para géneros para distinguir estos Tingidae estrechamente emparentados.

Palabras clave: Insecta, Neotropical, nuevos géneros, nuevas especies, lista de especies, distribución, clave.

The nine tingid genera included in this paper have a scarcely ornate appearance, with flat, elongate bodies and long, slender antennae. Tigava Stål, now the second largest genus of this group, currently contains 12 species (Drake and Ruhoff 1965; Montemayor 2008, 2012). Previously, Tigava comprised a polyphyletic collection of species, some of which are now placed in the related genera Campylotingis Drake and Bondar (1932) with 14 spp., Ceratotingis Montemayor (2008) with 4 spp., Niborskiana Montemayor (2012) with 2 spp., Tingicesa Koçak and Kemel (2010) with 2 spp., and Vatiga Drake and Hambleton (1946) with 5 spp. Moreover, the type species of Campylotingis (Drake and Bondar 1932), Niborskiana (Montemayor 2012), and Tingucesa (as Idiostyla Drake 1945) were first described in Tigava. The obvious reason for this confusion is the relatively elongate, mostly opaque bodies, the long antennae, the reduced paranota and pronotal hoods, and similar hemelytra. Montemayor (2012) called this group of Neotropical genera, including Macrotingis Champion with 4 spp., the Tigava complex and provided a key to distinguish them.

During two collecting expeditions to México and through searches of the Texas A & M University and National Museum of Natural History collections, we have discovered two new species, representing two new genera belonging to the Tigava complex, one from México and one from Venezuela. Herein, we provide a description, and color photographs of the new taxa, diagnoses of all genera in the Tigava complex, an updated checklist and distributions of their included species, and a revised key, modified from Montemayor (2012) to help distinguish genera.

MATERIAL AND METHODS
Adult color habitus images were captured using a Visionary Digital imaging system that included an Infinity Optics K2 long-distance microscope affixed to a Canon EOS 40D digital SLR camera. A Dynalite M2000 power pack and Microptics ML1000 light box provided illumination and image stacks were montaged using Helicon Focus 4.2.1; and head and pronotal plate was captured using an EntoVision Imaging Suite that included a JAI Technologies (AT-200GE) digital camera mounted to a Leica Z16 zoom lens via a Leica z-step microscope stand and multiple focal planes were merged using Cartograph 8.0.6 (Microvision Instruments, France) software. Plates were edited using Adobe Photoshop CS4 and numbered in Adobe Illustrator CS4.
Specimens are deposited in the following collections: TAMU (Texas A & M University, College Station; J. C. Schaffner), UNAM (Universidad Nacional Autónoma de México, México City; H. Brailovsky), USNM ([United States] National Museum of Natural History, Washington, D. C.; T. J. Henry)

Under “included species,” states are given for the larger countries Argentina, Brazil, and México.

RESULTS

**TAXONOMIC TREATMENT**

**Key to the Neotropical Genera of the *Tigava* Complex**

1. Distiflagellomere spindleshaped, thicker at middle than either end .......................................................... 2

2. Head with one spine; pronotum without lateral carinae or with only short carinae on posterior process (Fig. 3) .......................................................... **Macrotingis** Champion

   - Head with three spines; lateral carinae extending along entire length .......................................................................................................................... 5

3. Occipital spines short or abbreviated, not extending anteriorly beyond middle of eye; pronotal carinae low, not areolate; paranota narrow, strongly reflexed (Figs. 4, 10–12) .......................................................... **Mexicotingis** n. gen.

   - Occipital spines extremely long, extending well beyond anterior margin of eye; pronotal carinae high and areolate; paranota wide, areolate, and weakly curving upward .......................................................... 4

4. Occipital spines erect and divergent; paranota evenly rounded throughout; median pronotal carina highest over discal area; lateral height of hood much higher than lateral height of an eye (Fig. 2) ..............

   - Occipital spines reclining and convergent; paranota distinctly constricted on anterior half; median pronotal carina short and evenly high throughout; height of hood shorter than lateral height of an eye (Figs. 6, 13, 14) .............. **Paraceratotingis** n. gen.

5. Paranota wide, with anterior, inner-most areole much larger than remaining areolae ........................ 6

   - Paranota narrow, carinate or areolate, if areolate, anterior inner-most areola the same size as remaining areolae ............................................................. 7

6. Head with three or four spines; mesosternal rostral laminae strongly constricted (Fig. 9) .............. **Fatiga** Drake and Hamilton

   - Head with five spines; mesosternal rostral laminae parallel (Fig. 8) .................. **Tingicesa** Koçak and Kemel

7. Head with five spines (Fig. 1) .............. **Campylootingis** Drake and Bondar

   - Head with three spines .......................................................... 8

8. Occipital spines divergent and not extending to posterior margin of eyes; head with postero-orbital plates and lacking a deep median suture between eyes; costal area carinate (Fig. 5) .............. **Niborskiana** Montemayor

   - Occipital spines subparallel or convergent and extending to or surpassing anterior margin of eyes; head without postero-orbital plates and with a deep median suture present between eyes; costal area areolate (Fig. 7) .............. **Tigava** Stål

**Campylootingis** Drake and Bondar (Fig. 1)

**Campylootingis** Drake and Bondar 1932: 89 (original description); Drake and Poor 1936: 385 (list, type species); Monte 1939: 66 (list); Drake and Hambleton 1938: 39 Minas Gerais, Brazil; *C. clara* Drake and Hambleton [Drake and Hambleton 1942: Minas Gerais, Brazil]. *C. clavata* Drake and Hambleton [Drake and Hambleton 1939: Minas Gerais, Brazil], *C. genetica* Drake and Hambleton [Drake and Hambleton 1942: Minas Gerais, Brazil], *C. integra* Drake and Hambleton [Drake and Hambleton 1942: Minas Gerais, Brazil], *C. mollis* Drake and Bondar [Drake and Bondar 1932: Bahia, Brazil], *C. prudens* Drake and Hambleton [Drake and Ruhoff 1965: Argentina; São Paulo, Brazil], and *C. tantilla* Drake [Drake and Hambleton 1938: Brazil; Drake 1935: Paraguay].

**Diagnosis.** *Campylootingis* is recognized by the antenna shorter than the body; the scape as long as or shorter than the distiflagellomere; the slender filiform distiflagellomere; the five cephalic spines, with the occipital ones generally convergent and extending to the anterior margin of the head; the absence of postero-orbital plates; the sometimes constricted mesosternal rostral laminae; the scarcely developed to sometimes absent hood; the tricarinate pronotum, with the lateral carinae extending along the entire length; the narrow, reflected areolate or carinate paranota; and the discoidal area not extending to half the length of hemelytra.

**Ceratotingis** Montemayor (Fig. 2)


**Included species.** *C. costarriquense* Montemayor [Montemayor 2008: Costa Rica], *C. rafaeli* Montemayor [Maes and Knudson 2016: Nicaragua; Montemayor 2008: Panama], *C. spatula* (Monte) [Monte 1945: Goiás, Brazil], and *C. zeteki* (Drake) [Maes and Knudson 2016: Nicaragua; Drake 1950: Panama].

**Diagnosis.** *Ceratotingis* is distinguished by the length of the antenna longer than the body; the scape much longer than the distiflagellomere; the spindle-shaped distiflagellomere; the three cephalic spines with the occipital ones divergent and surpassing the anterior margin of the head; the absence of postero-orbital plates; the well-developed hood, higher than the lateral height of an eye; the tricarinate pronotum, with the lateral carinae extending...
along the entire length; the wide, areolate, evenly rounded paranota; and the discoidal area extending nearly to half the length of the hemelytra.

**Macrotingis** Champion

(Fig. 3)

*Macrotingis* Champion 1897: 22 (original description); Drake and Poor 1936: 387 (list, type species); Hurd 1946: 469 (description); Drake and Ruhoff 1960: 66 (list, type species), 1965: 294 (catalog); Brailovsky and Torre 1986: 902 (description, distribution, key); Froeschner 2003: 31 (diagnosis, key spp.); Montemayor and Costa 2009: 631 (diagnosis, key); Guilbert 2017 (online catalog). Type species: *Macrotingis biseriata* Champion, 1897. Subsequent designation by Drake and Poor, 1936: 387.

**Included species.** *M. biseriata* Champion [Froeschner 2003: Costa Rica; Drake 1928: Honduras; Champion 1897: Panama], *M. novicis* Drake [Drake 1928: Honduras; Froeschner 2003: Chiapas, México], *M. schaffneri* Froeschner [Froeschner 2003: Oaxaca, México], and *M. uniseriata* Champion [Champion 1897: Guatemala].

**Diagnosis.** Species of *Macrotingis* are recognized by the antenna longer than the body; the scape much longer than the distiflagellomere; the spindle-shaped distiflagellomere (Fig. 3); the single erect, frontal, cephalic spine; the absence of postero-oral plates; the well-developed hood higher than the lateral height of an eye; the pronotum uni- or tricarinate, with the lateral carinae abbreviated or absent; the wide, areolate, evenly rounded paranota; and the discoidal area not extending to half the length of the hemelytra.

**Mexicotingis** Henry, Montemayor, and Knudson, new genus

(Figs. 4, 10–12)


Type species: *Mexicotingis braillovskyi* Henry, Montemayor, and Knudson, new species.

**Diagnosis.** This new genus is distinguished by the antenna as long as or longer than the body; scape much longer than distiflagellomere; the spindle-shaped distiflagellomere; the three cephalic spines; the occipital ones extremely short and not extending anteriorly beyond the middle of an eye; the absence of postero-oral plates; the scarcely developed hood; the tricarinate pronotum, with the lateral carinae extending along the entire length; the narrow, reflexed paranota; and the discoidal area posteriorly undefined and not extending to half the length of hemelytra.

*Mexicotingis* shares the spindle-shaped distiflagellomere with *Ceratoatingis*, *Macrotingis*, and *Paraeratingis*, but can be distinguished by the short occipital spines, evenly low pronotal carinae, and the narrow, strongly reflexed paranota.

**Description.** Length of males 5.10–5.35 mm; length of females 5.25–5.35 mm. Head shorter than broad, impunctate, with three cephalic spines; occipital pair weakly convergent, extremely short, arising near posterior margin of eyes and ending before middle of eyes; median spine relatively short, stout, and erect. Eye ovate in lateral view, higher than long. Antennae long and slender, distiflagellomere spindle-shaped in lateral view, more slender in dorsal view, with numerous erect and semierec setae, total antennal length slightly longer than length of body (1.12–1.16 times). Bucculae touching anteriorly, enclosing all of labial segment I and basal half of segment II; laminae broadest posteriorly, relatively long, extending past base of head and onto prosternum just beyond collar. Labium short, extending only slightly beyond bases of procoxae. Pro- and mesosternal laminae parallel and areolate; metasternal laminae mostly rounded, with only the posterior margin truncate. Pronotum evenly and finely punctate, with three low, non-areolate carinae, lateral carinae ending at bases of calli; disc moderately convex; calli impunctate; hood short, little higher than median carina; collar distinct, width subequal to height of hood in lateral aspect. Hemelytra elongate, subparallel, narrowing slightly on apical two thirds before flaring and becoming rounded distally, extending well beyond apex of abdomen; hypocosta narrow, with one row of tiny areolae; costal area narrow, anterior half carinate, posterior half areolate; subcostal area narrow, with two irregular rows of small areolae on basal two thirds, narrowing to one row beyond; discoidal area relatively distinct on basal two thirds before inner vein disappears, leaving posterior end open and undefined. Legs slender, nearly glabrous, with only tiny, short, recumbent setae on tibiae.

**Etymology.** The generic name comes from the country where all of the specimens were collected and the ending *tingis* indicates its family association. The gender is feminine.

**Mexicotingis braillovskyi** Henry, Montemayor, and Knudson, new species

(Figs. 4, 10–12)

http://zoobank.org/32C2E5B5-90A6-414C-AA59-5EC839109B1E

**Diagnosis.** General color yellowish brown; collar, apical third of pronotum and legs paler yellow. This species is distinguished from all other tingids by the structural characteristics given in the generic description.

**Description.** Male (*n = 4, plus holotype measurement in parentheses): Length 5.10–5.35 mm (5.15 mm). **Head:** Length 0.40–0.42 mm (0.42 mm), width 0.54–0.58 mm (0.56 mm), interocular width 0.26–0.27 mm (0.27 mm). **Labium:** Length 0.72–0.78 mm (0.75 mm). **Antenna:** Scape, 1.12–1.23 mm (1.14 mm); pedicel, 0.16 mm (0.16 mm); basiflagellomere, 3.30–3.80 mm (3.65 mm); distiflagellomere, 0.75–0.80 mm (0.80 mm). **Pronotum:** Median length 1.82–1.92 mm (1.79 mm), width across humeral angles 0.98–1.06 mm (1.01 mm). **Hemelytron:** Widest width of discoidal area 0.27–0.29 mm (0.27 mm). **Head:** Yellowish brown, impunctate, glabrous, frons with a deep median groove; eyes dark brown; inner margins of eye often with a narrow band of white exudate; buccalae pale or whitish. **Antenna:** Yellowish brown, scape darker yellowish brown; distiflagellomere spindle-shaped, black, slender base yellowish brown; scape with short, somewhat stout, pale setae; basiflagellomere with tiny, sparse setae, and distiflagellomere thickly set with relatively long erect and semierc setae. **Labium:** Segments I–III yellowish brown, segment IV fuscous. **Pronotum:** Yellowish brown...
with apical third, collar, paranota, and carinae paler yellow; calli slightly darker brown. **Hemelytron:** Yellowish brown, middle of discoidal area and an inverted V-shaped mark on distal third darker brown; areoles on apical third becoming larger and more translucent. **Ventral surface:** Yellowish brown, mesosternum black outside pale rostral laminae. **Legs:** Pale yellowish brown.

**Female** (n = 4): Length 5.25–5.35 mm. **Head:** Length 0.42–0.43 mm, width 0.56–0.58 mm, interocular width 0.27–0.29 mm. **Labium:** Length 0.75–0.80 mm. **Antenna:** Scape, 3.70–4.00 mm; pedicel, 0.14–0.16 mm; basiflagellomere, 1.10–1.23 mm; distiflagellomere, 0.77–0.80 mm. **Pronotum:** Median length 1.80–1.92 mm, width across humeral angles 1.02–1.09 mm. **Hemelytron:** Width of discoidal area 0.29–0.30 mm.

Similar to male in overall color and structure.

**Etymology.** We name this interesting new species after our friend and colleague, Dr. Harry Brailovsky, in honor of his many contributions to the study of Heteroptera, especially the Coreoidea and Lygaeoidea.

**Hosts.** This species has been taken on *Quercus* sp., *Quercus rugosa* Néé, and *Q. candidans* Néé [Fagaceae], and *Persea americana* Mill. [Lauraceae]. The three specimens from *Quercus* sp. (holotype and two paratypes) were collected by beating the outer branches of a large open-growing tree.

**Distribution.** Known only from the Mexican states of Jalisco, México, Michoacán, and Morelos.

**Type material.** HOLOTYPE ♂, México, Morelos, Felipe Neri, 19°01.602'N, 98°57.155'W, elev. 2425 m, 28 Feb. 2017, T. J. Henry & H. Brailovsky, ex *Quercus* sp. (USNM). PARATYPES: 5♂♂, 1♀, México, Jalisco, Nevado de Colima road, 5.9 mi W hwy jct (nr. Atenquique), 20–21 April 1977, R. Murray, M. Sweet, & J. C. Schaffner (4 ♂♂; TAMU; 1♂, 1♀ USNM); 1♂, 1♀, México, 14.8 mi NW Cd. Guzmán, 13 April 1980, Cuda & Schaffner (1♂ TAMU; 1♀ USNM); 1♂, México, Jalisco, 11 mi. NW Cd. Guzmán, 13 April 1980, Cuda & Schaffner (TAM). 1♂, México, México, Ciudad de Bravo, Avandaro, 3 Mar. 1974, A. Garcia (UNAM); 1♂, 1♀, México, Francisco Zarco, 2 km S of Tenancingo, Mex. Rd 55, 18°59.8’N, 99°34.9’W, elev. 2275 m, 19 Nov. 2003, T. J. Henry, H. Brailovsky, & L. Cervantes, ex *Persea americana* (USNM). 3♂♂, 4♀♀, México, Michoacán, 12 mi NE Uruapan, 17 April 1980, Cuda & Schaffner, taken on *Quercus rugosa* and *Q. candidans* (2♂♂, 3♀♀ TAMU; 1♂, 1♀ USNM); 2♂♂, 1♀, Michoacán, 11.5 mi. E Morelia, 9 April 1990, Ferreira & Schaffner, (TAMU). 1♂, 1♀, Morelos, same data as for holotype (1♂ UNAM, 1♀ USNM).

**Paraceratotingis Henry, Montemayor, and Knudson, new genus**

(Figs. 6, 13, 14)

http://zoobank.org/6B279786-C68B-4358-82BA-5FDBED17603D

Type species: *Paraceratotingis convergens* Henry, Montemayor, and Knudson, new species.

**Diagnosis.** This new genus is recognized by the antenna as long as or longer than the body; the scape much longer than the distiflagellomere; the spindleshaped distiflagellomere; the three cephalic spines, with the occipital ones surpassing anterior margin of eyes; the absence of postero-orbital plates; the small but well-developed hood; the tricarinate pronotum, with the lateral carinae extending along the entire length; the moderately wide, areolate paranota distinctly constricted on anterior half; and the discoidal area not extending to half the length of hemelytra.

**Paraceratotingis** shares with *Ceratotingis*, *Macrotongis*, and *Mexicotongis* a spindle-shaped distiflagellomere, but can be distinguished from these genera by the long, convergent occipital spines, the distinctly constricted anterior half of the paranota, and the short pronotal hood that is shorter than the lateral height of an eye.

**Description.** Length of holotype male 3.84 mm. Head length about two thirds width across eyes, impunctate, with a deep median groove or furrow on frons and three cephalic spines; the occipital pair, long, slender, arising at level just behind eyes, strongly convergent and nearly touching distally, median spine long, slender, subequal to dorsal width of an eye. Eye ovate in lateral view, higher than long. Antenna long and slender, subequal to body length, distiflagellomere spindle-shaped, with numerous erect and semierect setae, total length 3.88 mm. Bucculae touching anteriorly, enclosing all of labial segment I and base of II; laminae slightly broader posteriorly, long, extending past base of head and onto pronotum just beyond collar. Labium extending past mesocoxae to base of metasternum. Proand mesosternal laminae parallel; prosternal laminae short, nonareolate; mesosternal laminae higher with one row of areolae; metasternal laminae parallel. Pronotum evenly punctate on disc, punctures becoming areolate on posterior third; with three areolate carinae; disc weakly convex; calli shiny, impunctate; hood about two times as high as median carina; collar about as wide as height of median carina; paranota wide, distinctly constricted on anterior half, with two rows of evenly sized areolae. Hemelytron elongate, subparallel, rounded distally, extending well beyond abdomen; hypocosta narrow, with one row of tiny areolae; costal area wide, with two rows of large areolae; subcostal area narrow, about half the width of the costal area, with two rows of small areolae; discoidal area narrow, width subequal to width of subcostal area, not extending beyond basal third of hemelytra. Legs slender, with only fine, short, indistinct, recumbent setae.
Etymology. The name of this new genus is a combination of "New World" and "Tigava Lace Bug Complex". It is a genus of lace bugs, alluding to the apparent close relationship of these two genera. The gender is feminine.

Paraceratotingis convergens Henry, Montemayor, and Knudson, new species
(Figs. 6, 13, 14)
http://zoobank.org/7F65BFD7-CEFD-4A3E-BBE1-CAD4E111BC5E

Diagnosis. General coloration pale yellowish brown, head darker brown; calli black. This new species can be distinguished from all other tingids by the structural characteristics given in the generic description.

Description. Male (holotype): Length 3.84 mm. Head: Length 0.38 mm, width 0.58 mm, interocular width 0.28 mm. Labium: Length 1.14 mm. Antenna: Scape, 1.26 mm; pedicel, 0.14 mm; basi, 1.70 mm; disti, 0.78 mm. Pronotum: Median length 1.60 mm, humeral width 1.10 mm. Hemelytron: Length 2.75 mm, length of discoidal area 1.10 mm, width of discoidal area 0.24 mm.

Head: Shiny brown, clypeus dark brown, impunctate, glabrous, frons with a deep median groove; eyes dark brown; surface, especially around eyes and ventrally, with a scattered white exudate; bucculae pale yellow or whitish. Antenna: Yellowish brown, scape slightly darker brown; disti, shaped, black, slender base yellowish brown, with numerous long, semierect setae subequal to diameter of segment. Labium: Yellowish brown. Pronotum: Yellowish brown, with apical third, collar, paranota, and carinae paler yellow; calli black. Hemelytron: Pale yellowish brown; central areola slightly darker brown. Ventral surface: Yellowish brown; mesosternum and a small area above procacetabula black. Legs: Pale yellowish brown.

Female: Unknown.

Hosts. Unknown.


Other specimens examined. 1 [sex?] (abdomen and antennal segments III and IV missing), same data as for holotype (USNM).

Tigava Stål
(Fig. 7)
Tigava Stål 1860: 63 (original description), 1873: 121 (key); Drake and Poor 1936: 389 (list, type species); Monte 1939: 80 (list), 1941: 143 (catalog), 1944: 158 (n. sp., list); Hurd 1946: 449 (diagnosis, key); Drake and Ruhoff 1960: 84 (list, type species), 1965: 387 (catalog); Brailovsky and Torre 1986: 908 (description, distribution, key); Maes and Knudson 2016: 59 (list, distribution, hosts); Guilbert 2017 (online catalog). Type species: Tigava praecellens Stål, 1860. Monotypic.

Included species. T. bombacis Drake and Poor [Kormilev 1955: Argentinia; Drake and Poor 1938: Minas Gerais, Brazil], T. brevicollis Monte [Monte 1944: Rio de Janeiro, Brazil], T. ceibae Drake and Poor [Drake and Poor 1938: Bahia, Brazil; Drake and Ruhoff 1965: Paraguay], T. convexicollis Champion [Champion 1897: Panama], T. corumbiana Drake [Drake 1942: Matto Grosso, Brazil], T. ferruginea Monte [Monte 1940: “Brazil”], T. graminis Drake and Poor [Drake and Poor 1938: Bahia, Brazil], T. hambletoni Drake [Drake 1948: Peru], T. praecellens Stål [Stål 1860: Rio de Janeiro, Brazil; Drake and Poor 1937: Bolivia], T. pulchella Champion [Guilbert and Montemayor 2010: Jujuy, Argentina; Drake and Ruhoff 1965: Cuba; Guatemala; Honduras; Champion 1897: Veracruz, Mexico; Maes and Knudson 2016: Nicaragua], T. semota Drake [Drake 1931: “Chapada,” Brazil; Drake 1935: Paraguay], and T. tingoa Draken [Drake 1948: Peru].

Diagnosis. Members of this genus are recognized by the length of the antenna subequal to or shorter than the body; the scape and disti, subequal in length; the slender, filiform disti; the three cephalic spines, the occipital one long, convergent or sub-parallel, extending to or surpassing the anterior margin of eyes; the absence of postero-orbital plates; the scarcely developed or completely absent hood; the tricarinate pronotum, with the lateral carinae developed along the entire length; the narrow, areolate, or carinate paranota; and the discoidal area not extending to half the length of the hemelytra.

Tingicesa Koçak and Kemel
(Fig. 8)
Idiostyla Drake 1945: 97 (original description); Drake and Ruhoff 1960: 61 (list, type species); 1965: 248 (catalog); Montemayor 2012: 51 (list, key), Guilbert 2017 (online catalog). Type species: Tigava anona Drake and Hambleton, 1938. Preoccupied by Idiostyla Meyrich, 1921 (Lepidoptera) (Koçak and Kemel 2010: 152).

Tingicesa Koçak and Kemel 2010: 152 (new name).

Included species. T. anona (Drake and Hambleton) [Drake and Hambleton 1938: São Paulo, Brazil] and T. rollinae (Drake and Hambleton) [Drake and Hambleton 1934: Minas Gerais, Brazil].

Diagnosis. This genus is distinguished by the length of the antenna shorter than the body; the scape and disti, subequal in length; the slender, filiform disti; the five cephalic spines, with the occipital one long, convergent or sub-parallel, extending to or surpassing the anterior margin of the eyes; the absence of postero-orbital plates; the parallel mesosternal rostral laminae (Fig. 8); the small, but well-developed hood; the tricarinate pronotum, with the lateral carinae extending along the entire length; the wide paranota with the anterior, inner-most areola greatly enlarged; and the discoidal area not extending to half the length of the hemelytra.
Vatiga Drake and Hambleton
(Fig. 9)

Vatiga Drake and Hambleton 1946: 10 (original description); Hurd 1946: 466 (diagnosis, key); Drake and Ruhoff 1960 (list, type species), 1965: 424 (catalog); Froeschner 1993: 457 (diagnosis, key, synonymy); Guidoti et al. 2015: 412 (hosts, pest status); Maes and Knudsen 2016: 61 (list, distribution, host); Guilbert 2017 (online catalog). Type species: Vatiga vicosana Drake and Hambleton, 1946, a junior synonym of Leptopharsa manihotae Drake, 1922 (synonymized by Froeschner 1993: 460). Original designation.

**Included species.** V. cassiae (Drake and Hambleton) [Drake and Hambleton 1934: Minas Gerais, Brazil], V. illudens (Drake) [Drake 1922: Dominican Republic, Jamaica, Puerto Rico; Drake 1930: Minas Gerais and Sao Paulo, Brazil; Drake and Bruner 1924: Cuba, Haiti; Drake and Cobben 1960: Leeward Islands], V. manihotae (Drake) [Drake 1922, Drake and Hambleton 1946, Drake and Hambleton 1942: “Chapada,” Minas Gerais, and Sao Paulo, Brazil; Drake 1922: Trinidad; Monte 1939: Cuba; Drake and Ruhoff 1965: Argentina, Paraguay, Peru], V. paxillia (Drake and Poor) [Drake and Poor 1939: Corrientes, Argentina], V. variata Drake and Hambleton [Drake and Hambleton 1946: Rio Grande de Sul, Brazil], and V. varianta (Drake) [Drake 1930, Froeschner 1993: Bahia and Minas Gerais, Brazil; Froeschner 1993: Colombia].

**Diagnosis.** This genus is recognized by the length of the antenna shorter than the body; the scape shorter than the distiflagellomere; the slender, filiform distiflagellomere; the variable number of cephalic spines (two, three, four, or five), with the occipital ones varying in length and shape; the absence of postero-orbital plates; the deeply constricted mesosternal rostral laminae (Fig. 9); the scarcely developed to completely absent hood; the tricarinate pronotum, with the lateral carinae extending along the entire length; the wide paranota, with the anterior, inner-most areola greatly enlarged; and the discoidal area not extending to half the length of hemelytra.

**ACKNOWLEDGMENTS**

We thank editor José Luis Navarrete-Heredia for the invitation to participate in this special publication honoring Harry Brailovsky. We also are grateful to Harry Brailovsky (UNAM) and Joseph C. Schaffner (TAMU) for lending specimens used in this study and Taina Likwak (Systematic Entomology Laboratory, ARS, USDA, c/o USNM) for the color habitus plates of Mexicotingis brailovskyi and Paraceratotingis convergens. Marcus Guidoti Soares (Smithsonian Institution, Washington, D. C.) and Laura Torres Miller (West Virginia Department of Agriculture, Charleston, West Virginia) kindly reviewed the manuscript and offered suggestions for its improvement. Mention of trade names or products in this publication is solely for the purpose of providing specific information and does not imply recommendation or endorsement by the U.S. Department of Agriculture. The USDA is an equal opportunity employer.

**LITERATURE CITED**


