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A review of the Mexican *Frankliniella paricutinensis* species assemblage in the Intonsa group (Insecta, Thysanoptera: Thripidae), with description of a new species

Revisión del ensamble específico mexicano *Frankliniella paricutinensis* en el grupo Intonsa y descripción de una especie nueva (Insecta, Thysanoptera: Thripidae)

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Abstract. A second review of the 13 Mexican species in the *Frankliniella paricutinensis* Johansen species assemblage is presented, including the description of a new species. It was sampled from the onion *Allium cepa* L. agro-ecosystem, in 2 different localities in southern Tamaulipas. The study includes new records for 7 of the 13 previously described species. New morphological data, measurements of several specimens, and illustrations of head, thorax and abdomen, together with some ecological comments, are also included for the new species. A new key for the determination of the 14 species in the *F. paricutinensis* assemblage is provided.

Key words: Thysanoptera, *Frankliniella*, Mexico.

Resumen. Se hace la segunda revisión de las 13 especies mexicanas integrantes del ensamble específico *Frankliniella paricutinensis* Johansen. También se incluye la descripción de una especie nueva afín a este ensamble específico encontrada en agroecosistemas de cebolla *Allium cepa* L. en 2 localidades del sur del estado de Tamaulipas. El estudio incluye registros nuevos de 7 de las 13 especies previamente descritas. Se incluyen con la descripción de la especie nueva, datos morfológicos, medidas de varios ejemplares, así como ilustraciones de cabeza, tórax y abdomen, junto con algunos comentarios ecológicos. Se incluye una clave nueva para la determinación de las 14 especies del ensamble *F. paricutinensis*.

Palabras clave: Thysanoptera, *Frankliniella*, México.

Introduction

The microcosmic Thysanoptera genus *Frankliniella* is the second largest in the family Thripidae with 159 valid species, of which 151 are native to the New World, 7 to the Old World (Palearctic Region), and 1 is known only from Amsterdam Island, in the Indian Ocean (Nakahara, 1997). According to Nakahara (1997), 42 species are endemic to Mexico; an additional 44 species have been added recently (Johansen 1998a, 1998b, 2000, 2002; Johansen and Mojica, 1998, 2002). Furthermore, another 10 recently synonymized Mexican species (Nakahara, 1997) might be validated with additional taxonomic work. Trybom described the European species *Thrips intonsa* (Trybom, 1895). Karny erected the genus *Frankliniella* and included some species from the genus *Euthrips* (Karny, 1910);

subsequently (Karny, 1912) he classified *Thrips intonsa* Trybom, as *Frankliniella intonsa* (Trybom) for the first time. Hood (1914) designated *Frankliniella intonsa* (Trybom) as the type species of the genus *Frankliniella*. Hood (1925) grouped the species of genus *Frankliniella* Karny based on the morphology of the pedicel in antennal segment III; thus, he erected 3 species groups: 1), the “*Frankliniella minuta* (Moulton) species group” with the pedicel in antennal segment III simple, cylindrical or slightly swollen, and with the interocellar and major pronotal anteroangular and anteromarginal setae reduced; 2), the “*Frankliniella intonsa* (Trybom) species group” with the pedicel in antennal segment III simple, cylindrical or slightly swollen, and with the interocellar and major pronotal anteroangular and anteromarginal setae variable, from very short to elongated, and 3), the “*Frankliniella cephalica* (D. L. Crawford) species group” with the pedicel in antennal segment III enlarged, with an angulation or

sharp-edged saucerlike ring, and interocellar and major pronotal setae long. Later, Moulton (1948), in his world review of the genus *Frankliniella*, followed Hood's grouping system, but he added as a species identifying character the position of the interocellar setae. Another contribution of Moulton (1948) was the subgrouping of the Intonsa Group in 3 species series: Intonsa Series, Insularis Series and Tenuicornis Series. The Cephalica group was also subgrouped in 2 species series: the Cephalica Series and the Tritic Series.

Mound and Marullo (1996) reviewed and produced a key for the Central and South American species of *Frankliniella*, but did not accept the previous species grouping of Hood (1925) and Moulton (1948).

The following species assemblages have been proposed in the "Intonsa Group": the Mexican *Frankliniella desertileonidum* Watson assemblage (Johansen, 1998a); the Mexican *Frankliniella paricutinensis* Johansen assemblage (Johansen, 2000); the Mexican *Frankliniella fusca* (Hinds), *F. pallida* (Uzel), and *F. schultzei* (Trybom) assemblages (Johansen (2002); the Mexican *Frankliniella anitahoffmanae* Johansen and Mojica assemblage (Johansen and Mojica-Guzmán, 1998); the Mexican *Frankliniella aurea* Moulton, *F. bisetaevenusta* Johansen and Mojica, and *F. prothoraciglabra* Johansen and Mojica assemblages (Johansen and Mojica-Guzmán, 2003).

Finally, Johansen (1998b) erected the "*Frankliniella curiosa* Priesner species Group" (including 8 new Mexican species), because of the outstanding morphology of the antennal segment III in adults, in which a ventrally projected beak covers the cylindrical or slightly swollen pedicel. The group was divided in 4 species assemblages.

Johansen (2000) erected the *Frankliniella paricutinensis* species assemblage to include 13 new Mexican species, whose descriptions were based only in adults of both sexes. Each diagnosis was based on several morphological characters, as follows: 8 from the head, 15 from the thorax, and 8 from the abdomen. Also considered were color characters of the head (including antennae), thorax (including wings and legs), and abdomen. A close relationship between this assemblage and the *F. desertileonidum* Watson species assemblage was proposed, based mainly on features of the postocular setae formula which lacks the first setae: ii-iii, IV, according to Johansen (1998). All the species of the *F. paricutinensis* species assemblage are known from the Mexican Transverse Volcanic Range (at altitudes from 2 190 to 4 100 m, except *F. vulcanorizabensis*, which was also collected in the Sierra Madre Oriental, at an altitude of 1 900 m. In this study, we report new locality records for 7 of the above species and describe a new species from southern Tamaulipas.

This genus is one of the largest in the family Thripidae

(227 species, 90 % from the Neotropics), only surpassed by the genus *Thrips* Linnaeus, 1758 (280 species worldwide), according to Jacot-Guillarmod (1979), Moulton (1948), and Nakahara (1997). The genus is homogeneous in the range of body form and characters (head outline and sculpture; antennae; pronotum outline and sculpture; major and minor setae; pterothorax meso- and metanotum sculpture; the outline of meso- and metasternum plates; the morphology of the mesofurca and metafurca; the sculpture of abdominal tergite I; the posteromarginal comb, in tergite VIII; tergites IX and X chaetotaxy; morphology and number of sternal glands in the males). More details are given by Hood (1925); Stannard (1968); Sakimura and O'Neill (1979); Mound and Nakahara (1994); Johansen (1998a, 1998b, 2000); Johansen and Mojica (1998, 2003), and Berzosa and Maroto (2003). Despite great taxonomic progress in the group by discovering, describing and publishing species, the characterization of immature stages and biology has only been accomplished for a few species of economic importance: (Harrison 1963; Lacasa and Lloréns 1996, 1998); *F. bispinosa* (Morgan). *F. fusca* (Hinds), *F. insularis* (Franklin), *F. intonsa* (Trybom), *F. minuta* (Moulton), *F. occidentalis* (Pergande), *F. pallida* (Uzel), *F. parvula* Hood, *F. schultzei* (Trybom), and *F. tenuicornis* (Uzel).

Material and methods

The newly recorded specimens are deposited in the Colección Nacional de Insectos, Instituto de Biología, Universidad Nacional Autónoma de México, México, D. F. (IBUNAM). Specimens were sampled directly from onion plants, using a fine brush moistened with 70 % ethanol. Specimens were subsequently dehydrated in the laboratory, with a series of 80, 95 and 100 % (absolute) ethanol, washed with xylene for clearing, and finally mounted on slides with Canada balsam. Illustrations of the new species were based on the mounted specimens using camera lucida equipment under 2 different magnifications (400 and 1000 X).

The following abbreviations were employed:

Head

Intocc = interocellar setae (pair III)

Postoc = postocular setae ii-iii, IV

Pronotum

AA = Major anteroangular setae

AM = Major anteromarginal setae

PA = Major posteroangular setae

am = minor anteromarginal setae

pm = minor posteromarginal setae

Abdomen

IXi, IXii, IXiii = Tergite IX major caudal setae; XI, Xii = Tergite X major subposteromarginal setae.

Results

The *Frankliniella paricutinensis* Johansen 2000, species assemblage.

Diagnosis. Small species (females: 1.35-1.86; males: 1.21-1.49 mm in length) in the Intonsa group. Body color predominantly dark chestnut to blackish brown, with abundant orange subhypodermal pigment. Antennal segments III-V bicolored yellow and brown. Tarsi yellow to yellowish-brown. Fore wings dark chestnut brown, with a white-hyaline sub-basal transverse band; hind wings whitish yellow, with a dark brown median longitudinal vitta. Ocellar crescents orange to red. Body setae dark blackish-brown. Morphology. Head (Fig. 1) broader than long in posterior half; occiput sculptured with open, parallel and confluent (at middle and sides) striae. Postocular setae formula: ii-iii, IV, v-vi. Compound eyes ellipsoidal, slightly or not protruding. Antennal segments typical in the group (Fig. 4), III with slightly swollen or fungiform pedicel, IV-VI globose elongate. Mouth cone pointed, shorter to longer than the dorsal length of head. Pronotum (Fig. 1) with its surface mainly smooth, but with some faint transverse striae in anterior margin, which become stronger in posterior margin. Mesonotal plate (Fig. 5) transverse, hexagonal and with open transverse striae, which become confluent at center and sides; with a pair of apical campaniform sensilla. Metanotal scutum (Fig. 6) with polygonal reticulation forming a triangle at center (transverse anteriorly, longitudinal behind), and longitudinal striae at sides; setae in anterior margin; with a pair of sub-basal campaniform sensilla. Pterosternum (Fig. 2) with a transverse hexagonal to nearly pentagonal

mesosternum, mesofurca and spinula strong. Tergite VIII commonly with a complete posteromarginal comb, rarely broadly interrupted at middle (Fig. 3). Segment X longer than broad. Males of only 5 species with 1 circular to slightly ellipsoidal glandular area on each of sternites II-VII.

Remarks

Females and males of *F. paricutinensis* Johansen, *F. desertileonidum* Watson and *F. aurea* Moulton are different from species of other assemblages within the “Intonsa group” due to their lack of postocular seta I, thus giving the setae formula: ii-iii, IV, v-vi. In other complexes the formula is i-iii, IV, v-vi. In the case of the *F. paricutinensis* Johansen assemblage, the forewing color, which is dark brown with a white sub-basal transverse band (a shared character with the species in the *Frankliniella intonsa* Trybom and *F. insularis* (Franklin) assemblages) is the main difference with the *F. desertileonidum* Watson assemblage. In this species assemblage, the forewing is dark brown with 2 white transverse bands, 1 sub-basal, the other one apical in the sense of Johansen (1998). In the case of the *F. aurea* Moulton, *F. bisaetaevenusta* and *F. prothoraciglabra* species assemblages, a clear yellow forewing is a shared character with the *F. occidentalis* (Pergande) species assemblage (Johansen and Mojica 2003).

New records

Frankliniella axochcoensis Johansen, 2000
ESTADO DE MÉXICO: Montes de Ocuilan, km 7-8 on road to Lagunas de Zempoala 2700 m. (Volcanic Range); 25-I-1987, 1 ♀ in flowers of Asteraceae in *Abies religiosa* (Kunth) Schltld and Chami and *Pinus* spp. forest (R. M. Johansen).

Key for separating the *Frankliniella aurea* Moulton, *F. desertileonidum* Watson, *F. paricutinensis* Johansen and *F. intonsa* Trybom assemblages within the “Intonsa Group”.

1. Postocular setae i absent; formula: ii-iii, IV, v-vi2
 - Postocular setae i present; formula: i-iii, IV, v-vithe other assemblages
2. Forewings dark chestnut brown, with 2 white transverse bands: basal and apical or, only the basal one present; body predominantly dark chestnut brown3
 - Forewings and body predominantly pale yellow..... *F. aurea* Moulton, *F. bisaetaevenusta* Johansen and Mojica. *F. occidentalis* (Pergande), and *F. prothoraciglabra* Johansen and Mojica assemblages.
3. Metanotal scutum with a pair of sub-basal campaniform sensilla4
 - Metanotal scutum lacking campaniform sensilla*F. intonsa* Trybom assemblage
4. Forewings with white basal transverse band only*F. paricutinensis* Johansen assemblage
 - Forewings with white and apical transverse bands.....*F. desertileonidum* Watson assemblage

Taxonomic list.

- | | |
|--|---|
| 1. <i>Frankliniella axochcoensis</i> Johansen, 2000. | 8. <i>F. nauhcampatepetlensis</i> Johansen, 2000. |
| 2. <i>F. carmenmendietae</i> Johansen, 2000. | 9. <i>F. paricutinensis</i> Johansen, 2000. |
| 3. <i>F. copilcoensis</i> Johansen, 2000. | 10. <i>F. popocatepetlensis</i> Johansen, 2000. |
| 4. <i>F. exiguavulcanoperotensis</i> Johansen, 2000. | 11. <i>F. tamaulipeca</i> sp. nov. |
| 5. <i>F. festucavulcanica</i> Johansen, 2000. | 12. <i>F. vulcanorizabensis</i> Johansen, 2000. |
| 6. <i>F. jaroslavpelikani</i> Johansen, 2000. | 13. <i>F. vulcanoperotensis</i> Johansen, 2000. |
| 7. <i>F. lopezochoterennai</i> Johansen, 2000. | 14. <i>F. vulcanotolucensis</i> Johansen, 2000. |

Key to the species in the *Frankliniella paricutinensis* species assemblage.

1. Posteromarginal comb in tergite VIII always complete in both sexes2
 - Posteromarginal comb in tergite VIII with a broad gap at middle (only present by 2 microtrichia at both extreme sides), only females known*F. tamaulipeca* sp. nov.
2. Pronotum smooth in the middle.....3
 - Pronotum with 1-4 setae in the middle.....6
3. Pronotum with 1-2 subposteromarginal setae4
 - Pronotum lacking subposteromarginal setae*F. vulcanorizabensis* Johansen
4. Anteocellar setae (pairs I-II) shorter to subequal than one ocellar diameter; interocellar setae (pair III) moderately long (2.5-3.3 times the ocellar diameter). Antennal segment III slightly shorter than VI5
 - Anteocellar setae (pairs I-II) longer than one ocellar diameter; interocellar setae (pair III) long (4.0 times the ocellar diameter). Antennal segment III longer than VI*F. vulcanotolucensis* Johansen
5. Major pronotal anteroangular and anteromarginal setae shorter than posteromarginal ii. Anteocellar setae (pairs I-II) shorter than pronotal minor anteromarginal setae.....*F. festucavulcanica* Johansen
 - Major pronotal anteroangular and anteromarginal setae subequal in length to posteromarginal ii. Anteocellar setae (pairs I-II) subequal in length to pronotal minor anteromarginal setae.....*F. exiguavulcanoperotensis* Johansen
6. Mesosternal plate hexagonal, with straight sides.....7
 - Mesosternal plate with fore marginal and antero-lateral sides broadly curved. Tergite VIII with posteromarginal comb bearing sparse microtrichia.....*F. vulcanoperotensis* Johansen
7. Pronotum with a pair of median subposteromarginal setae.....8
 - Pronotum lacking subposteromarginal setae.....*F. copilcoensis* Johansen
8. Pronotal major anteromarginal setae subequal to shorter than postocular IV.....9
 - Pronotal major anteromarginal setae longer than postocular IV.....11
9. Pronotum with only 1 pair of setae at center; metanotal scutum with transverse reticulation in anterior one fourth, followed by small equiangular polygons, and elongate reticulation in posterior one half.....10
 - Pronotum with 4 setae forming a rhombus; metanotal scutum sculptured with transverse polygons in anterior one third, followed by equiangular polygons at center surrounded by elongate reticulation.....*F. jaroslavpelikani* Johansen
10. Interocellar setae (pair III) longer than compound eyes width and postocular setae IV.....
 -*F. nauhcampatepetlensis* Johansen
 - Interocellar setae (pair III) shorter than compound eyes width, and subequal to postocular setae IV.....
 -*F. axochcoensis* Johansen
11. Anteocellar setae (pair I) shorter than lateral ones (pair II), or one ocellar diameter; postocular v longer.....12
 - Anteocellar setae (pair I) shorter than the lateral ones (pair II), or one ocellar diameter.....13
12. Mesosternal plate with both antero-lateral sides longer than the rest. Postocular setae ii longer and stouter than iii or IV.....*F. paricutinensis* Johansen

- Mesosternal plate with both antero-lateral sides subequal to the posterior ones. Postocular setae ii subequal in length to iii, both shorter than v.....*F. lopezochoterenai* Johansen
- 13. Pronotum with 1 setae at center; metanotal scutum sculptured with transverse polygons in anterior one third, followed by elongate reticulation in posterior two thirds.....*F. carmenmendietae* Johansen
- Pronotum with 4 setae forming a curve at center; metanotal scutum with some close transverse polygons in anterior one sixth, followed by large equiangular polygons, and elongate reticulation in posterior one half, and with some equiangular polygons at base.....*F. popocatepetlensis* Johansen

Frankliniella copilcoensis Johansen, 2000.

ESTADO DE MÉXICO: on road to Nevado de Toluca Volcano, 3480 m. (Volcanic Range), 3400 m.; 30-V-1987, 1 ♀ in Poaceae in *Pinus* forest (R.M. Johansen).

IDEM ET IBIDEM: 30-XI-1987, 1 ♂ in flowers of Asteraceae in *Pinus* forest (R.M. Johansen).

Frankliniella nauhcampatepetlensis Johansen, 2000.

DISTRITO FEDERAL: Sierra de Ajusco, km 42 on road Méx-95 (Volcanic Range), 3000 m.; 24-I-1987, 2 ♀♀ in flowers of *Senecio* sp. and *Baccharis* sp. in *Pinus* spp. forest (R.M. Johansen).

Frankliniella paricutinensis Johansen, 2000.

ESTADO DE MÉXICO: on road to Nevado de Toluca Volcano, (Volcanic Range) 3480 m.; 1 ♀ in Poaceae (*Muhlenbergia* sp.?) in *Pinus* forest, (R.M. Johansen).

IDEM ET IBIDEM: 1 ♀ in flowers of Asteraceae in *Pinus* forest (R.M. Johansen).

Frankliniella vulcanorizabensis Johansen, 2000.

ESTADO DE MÉXICO: on road to Nevado de Toluca Volcano (Volcanic Range), 3880 m.; 20-XI-1987, 1 ♂ in Poaceae (*Muhlenbergia* sp.?) in *Pinus* forest (R.M. Johansen).

DISTRITO FEDERAL: Sierra de Ajusco, km 42 on road Méx-95 (Volcanic Range), 3000 m.; 1 ♂ by beating *senecio* sp. and *baccharis* sp. bushes in *Pinus* spp. forest (R.M. Johansen).

Frankliniella vulcanoperotensis Johansen, 2000.

ESTADO DE MÉXICO: km 9 on road to Lagunas de Santa Martha (Volcanic Range); 21-V-1989, 1 ♀, 1 ♂ (no further data), (anonymous).

Frankliniella vulcanotolucensis Johansen, 2000.

ESTADO DE MÉXICO: km 4 on road to Nevado de Toluca Volcano (Volcanic range), 3680 m.; 21-III-1987, 1 ♀ in flowers of *Senecio salignus* in *Pinus* forest (R.M. Johansen).

IDEM ET IBIDEM: 5-XII-1987, 1 ♂ in Poaceae in *Pinus* forest (*Muhlenbergia* sp. ?) (R.M. Johansen).

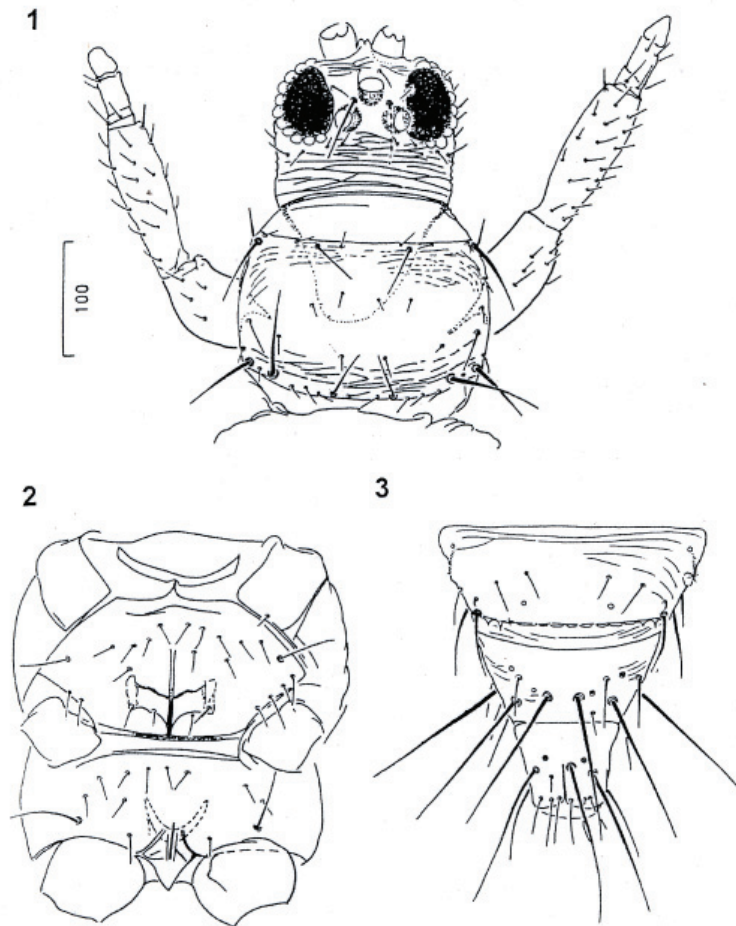
Frankliniella tamaulipeca sp. nov. (Figs. 1-7)

Female. Body color dark chestnut brown with abundant orange subhypodermal pigment, except yellowish-brown at middle of head and in thorax. Antennal segments: I light brown; II yellowish-brown; III dark brown slightly clear at base; IV-V dark brown, yellowish in basal one half and one fifth respectively; VI-VIII dark brown. All tarsi and tibiae yellow; femora dark brown, yellow in both extremes. Fore wings typical: light brown darker in veins, lighter at base; hind wings whitish, brownish at base and with a dark brown median longitudinal vitta. Ocellar crescents light orange. Body setae dark chestnut brown.

Morphology. Head in dorsal aspect (Fig. 1), broader at eyes (1.41 times) and at middle (1.014) times than long: cheeks slightly sinuouse; occiput with parallel striae, confluent near middle and both sides. Antennal segments (Fig. 4), III longer than IV, VI the longest. Mouth cone rounded and shorter than head. Pronotum (Fig. 1) almost smooth, but with faint transverse and confluent striae on anterior and posterior margins; with a median pair of subposteromarginal setae. Pterothorax; mesonotum (Fig. 5) with parallel and open transverse striae and, with a pair of very broadly separated apical campaniform sensilla; metanotum (Fig. 6) sculptured with almost concentric equiangular (at center) and longitudinal polygons, with a pair of basal campaniform sensilla; pterosternum (Fig. 2), mesosternal plate hexagonal and transverse, mesofurca as shown in Fig. 2. Abdomen, tergite I (Fig. 7); tergite VIII (Fig. 3), with the posteromarginal comb broadly interrupted at middle (with a discrete craspedum) and only present by 2 microtrichia at both extreme sides.

Measurements (holotype ♀, 5 paratypes ♀♀ in µm). Body length: 1.485-1.638 mm.

Head dorsal length: 96-116. Width at eyes: 134-142, behind eyes: 130-138, middle: 132-140, basal: 126-138. Chaetotaxy, intocc: 40-50; postoc: ii 10-12, iii 9-10, IV 14-16. Compound eyes, length: 56-60, width: 40-50. Ocelli, fore: 12-20, hind: 12-14. Antennal segments, length (width): I 22-24 (24-28), II 32-36 (22-26), III 40-46 (16-22), IV 34-44 (18-20), V 40-44 (16), VI 46-50 (14-16), VII 8-12 (6-8), VIII 14-16 (4-6). Thorax; pronotum, length: 116-130; width at middle: 180-202. Chaetotaxy, major



Figures 1-3. Dorsal and ventral views of *Frankliniella tamaulipecta* sp. nov. Holotype ♀. 1, head, prothorax and fore legs; 2, meso- and metasternum (ventral); 3, tergites VIII-X. Scale in μm (100 X).

setae: AA 50-60, AM 34-38; PA, outer: 54-58, inner: 66-72; minor setae: aa 18-22, am 10-12; pm i: 16-18, ii: 34-38, iii: 12-16. Mesothorax, width: 238-274; metathorax, width: 222-270. Fore wings, width at base: 80-100, middle: 44-60; veins chaetotaxy, fore: 16-19, hind: 11-14. Abdomen; width at segment IV: 270-338. Tergite IX setae, IX i: 114-126, IX ii: 120-134. Tergite X setae, X i: 106-128.

Material examined. Holotype ♀, paratypes 6 ♀♀, TAMAULIPAS: González near Altamira 110 m.; 29-I-2004 (Holotype, 4 paratypes) in onion plants *Allium cepa* L. (G. Velásquez), in IBUNAM.

Altamira 26-30 m., 2-II-2004 (2 paratypes) in onion plants *Allium cepa* L. (G. Velásquez), in IBUNAM.

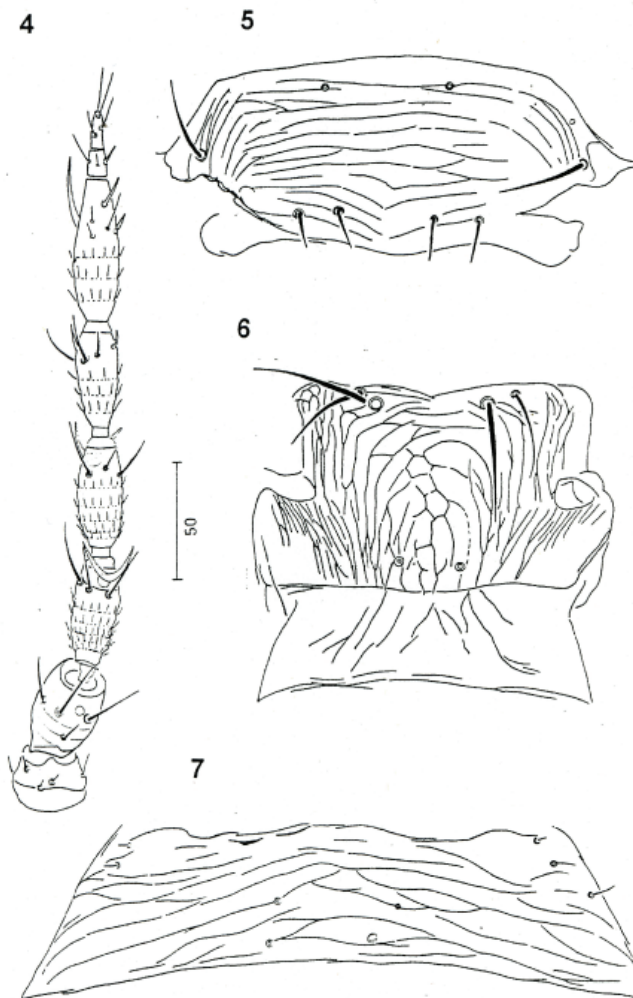
Comments. *Frankliniella tamaulipecta* sp. nov. is different from the remaining species belonging to the *F. paricutinensis* assemblage, because its female adults lack a complete posteromarginal comb in tergite VIII (only

present at both sides, by a pair of microtrichia), and because in the mesonotal plate the anteroangular campaniform sensilla are broadly separated. These characters are presumably apomorphic, whereas the plesiomorphic condition is probably possession of a complete posteromarginal comb in tergite VIII with the mesonotal sensilla closely placed. The lack of a complete posteromarginal comb (only present at both sides by 2-5 microtrichia) is not a common character in adults of either sex of *Frankliniella* species. Well known examples with this trait are *Frankliniella cephalica* (D.L.Crawford), *F. bispinosa* (Morgan) and *F. melanommata* Williams (all in the Cephalica Group, according to Moulton, 1949), but also *F. schultzei* (Trybom, 1910) according to Nakahara (1997) and Johansen (2002). However, in *Frankliniella fusca* (Hinds, 1902), *F. seneciofusca* Johansen

(2002), *F. vulcanofusca* (2002), *F. pallida* (Uzel, 1895), *F. pallidatagetes* Johansen (2002), *F. seneciopallida* Johansen (2002), *F. zapotecafusca* Johansen (2002), and the adult males of *F. hemerocallis* J.C. Crawford (1948), the posteromarginal comb in tergite VIII is entirely absent.

Derivatio nominis. From the huasteca language: tamaulipa, singular for the indigenous people the tamaulipas (plural) of northeastern Mexico; also meaning "a flower place", "place of flowers".

Biological and ecological aspects. None of the immature (larvae and pupae) stages of any of the species in the *Frankliniella paricutinensis* species assemblage has been recorded. Only adults were available for observation and study. There is enough information to record this stage, or to establish that the adults are flower dwellers in Poaceae and Asteraceae, according to Johansen (2000). *Frankliniella tamaulipecta* sp. nov. is the only species in the assemblage recorded in an agroecosystem (*Allium*



Figures 4-7. Dorsal views of *Frankliniella tamaulipecana* sp. nov. Holotype ♀. 4, right antenna; 5, mesonotum; 6, metanotal plate; 7, tergite I. Scale in μm (1000 X).

cepa L.), sharing this microhabitat with *Thrips tabaci* Lindeman (onion thrips). Furthermore, some adults of *F. tamaulipecana* were found as flower dwellers. Finally, *F. tamaulipecana* is the only species in the *F. paricutinensis* assemblage that occurs at an altitude near sea level, in the Gulf of Mexico Coastal Plain, whereas the other 13 species are high-altitude (1 990-4 100 m) inhabitants of natural ecosystems.

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