THE MEXICAN *FRANKLINIELLA ANITAHOFFMANNAE* SP. NOV. SPECIES ASSEMBLAGE, IN THE "INTONSA GROUP" (INSECTA, THYSANOPTERA: THRIPIDAE)

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RESUMEN

Se describen cuatro especies nuevas de *Frankliniella* en el Grupo Intonsa, del Eje Volcánico Transversal de México, que al compartir varios caracteres de coloración y morfología, integran un ensamble específico. Se analizan y discuten las probables relaciones de afinidad con el ensamble específico *Frankliniella desertileonidum* Watson. Se incluyen ilustraciones de cabeza, antenas, tórax y abdomen, de cada especie.
Palabras Clave: Ensamble específico *Frankliniella anitahoffmannae*, Especies nuevas, Taxonomía, Distribución, México.

ABSTRACT

Four new species of *Frankliniella* in the Intonsa Group, from the Mexican Volcanic Range, are described herein. Since their adults share several color and morphologic characters, they are included in a "specific assemblage". The probable morphologic relationships with the *Frankliniella desertileonidum* species assemblage are analized and discussed. Illustrations of the head, antennae, thorax and abdomen of each species, are included.
Key Words: *Frankliniella anitahoffmannae* specific assemblage, New species, Taxonomy, Distribution, Mexico.

INTRODUCTION

The genus *Frankliniella* was created by Karny (1910). After the next 38 years, Moulton (1948), published his full World revision of genus *Frankliniella*. He divided the "Intonsa Group" in three species series: "Intonsa", "Insularis" and "Tenuicornis". In the Intonsa group, Intonsa series he included 89 names (species and forms). Within this number, 25 were considered as Mexican species. Johansen & Mojica (1996) in a preliminary study of the Mexican species in the genus *Frankliniella*, they included 149 species (46 belonged to the Intonsa Group). Watson (1942) described his Mexican species *Frankliniella desertileonidum* (from the Desierto de los leones National Park, near Mexico City). According to Moulton (1948), in his key to the species in the Intonsa group, the four species in the

Frankliniella anitahoffmannae described herein, should be determined as "*F. desertileonidum* Watson". However, a recent examination of a *Frankliniella desertileonidum* Watson Paratype, together with four new Mexican related species (a species assemblage), cleared up this apparent resemblance. Furthermore, it is now clear that the adults of the *Frankliniella desertileonidum* Watson species assemblage, share the body, antennal segments III-VI, and fore wings color, with those in the *F. anitahoffmannae* species assemblage (this explain why the authors used the name *desertileonidum* as a suffix for three species names). However, both assemblages can be separated one from the other, because in the *Frankliniella anitahoffmannae* species assemblage, the postocular setae formula is: i-iii, IV, v, vi, whereas in the *F. desertileonidum* species assemblage, because of the lack of the first postocular setae, the formula is: ii-iii, IV, v, vi.

Since the species number in the Intonsa group is still increasing, the species assembling is a good classification solution.

The terms group and assemblage, are used here as neutral terms in the sense of Mayr and Ashlock (1991).

MATERIAL AND METHODS

The illustrations from the adults of each species, are realistic microscopic interpretations, taked from Canada balsam mounted specimens, and using a camera-lucida equipment, in two magnifications: 400 and 1000 X.

RESULTADOS

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ABBREVIATIONS

Head

intocc = interocellar setae (pair III)

postoc = postocular setae i-iii, IV

Pronotum

AA = Major anteroangular setae

AM = Major anteromarginal setae

PA = Major posteroangular setae

am = minor anteromarginal setae

pm = minor posteromarginal setae

Abdomen

IX i, IX ii, IX iii = Tergite IX major caudal setae; X = Tergite X major subposteromarginal setae.

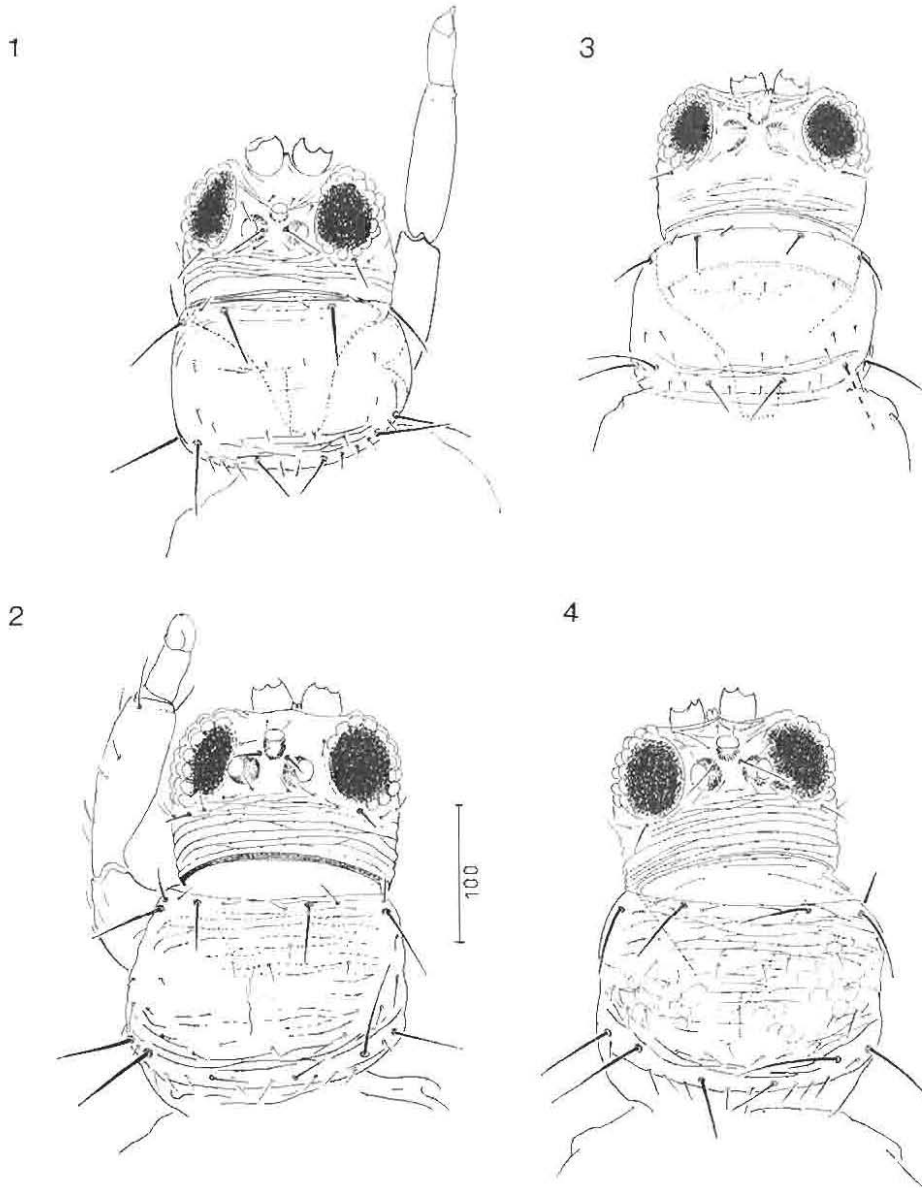
The *Frankliniella anitahoffmannae* sp. nov. species assemblage

Diagnosis. Small species (females: 0.990-1.37 mm in length) in the Intonsa group. Body color predominantly dark chestnut-brown, but also bicolored, with abundant orange subhypodermal pigment. Antennal segments III-V whitish-yellow to darked at apex. Fore wings brownish at base and middle, with a clear transverse band subbasally, and in apical one third. Ocellar crescents orange to crimson red. Body setae dark brown. Head (Figs. 1-4) broader than long at middle; occiput sculptured with open transverse and confluent striae. Chaetotaxy as follows: anteocellars (pair I) shorter than ocelli; lateral anteocellars (pair II) shorter to as long as ocelli; interocellars (pair III) shorter to longer than one ocellar diameter; postoculars formula: i-iii, IV, v-vi. Compound eyes ellipsoidal, slightly or not protruding. Antennal segments (Figs. 5-6, 8, 10) typical in the group, III with slightly fungiform pedicel. Mouth-cone as long as or longer than the dorsal length of head. Pronotum (Figs. 1-4) almost smooth to sculptured with transverse and confluent striae: chaetotaxy as follows: major anteroangulars and anteromarginals shorter than posteroangulars; two minor anteromarginals; 2-3 in a median transverse row; 2-6 subposteromarginals, the median pair advanced or not. Pterothorax; pterosternum (Figs. 7, 9, 11-12), mesofurca with long spinula; mesonotum (Figs. 13-16) with open and faint transverse striae; metanotum (Figs. 17-20) with an approximate and subbasal campaniform sensilla pair. Abdomen; tergite VIII with a complete posteromarginal comb of microthrichia (Figs. 24-27). Tergite IX major caudal setae IX i-iii as long as or longer than tergite VIII.

Specific differential characters. The following color and morphologic characters are usefull in determining species: body color (specially of head), of antennal segments III-VI, and of tibiae. Head and pronotum chaetotaxy. Pronotal sculpture. Pterothorax; pterosternum, the mesosternal plate and the mesofurcal spinula are variable. The mesonotum shape is variable. The metanotal sculpture is also variable, as well as that of tergite I.

Comments. The studied material is scarce, and composed of adult females only. Furthermore, with the exception of *Frankliniella falsadesertileonidum*, the rest of the species have a holotypic description.

Relations with other assemblages within the Intonsa group. In the antennal segments III-V and the fore wings color, the *Frankliniella anitahoffmannae* and the *F. desertileonidum* assemblages are apparently related. However, they can be separated because in the *F. desertileonidum* species assemblage the postocular setae i is wanting and the formula is: ii-iii, IV, whereas in the *F. anitahoffmannae* species assemblage the formula is: i-iii, IV. The postocular setae formula: i-iii, IV, v, vi is the most common and generalized in the Intonsa group. In this sense, there is more affinity between the *Frankliniella anitahoffmannae* species assemblage with the others, within the Intonsa group.



Figures 1-4

Dorsal views of the head, pronotum and fore leg from *Frankliniella* spp. adult ♀ holotypes. 1. *falsadesertileonidum* sp. nov. (with right fore leg) 2. *anitahoffmannae* sp. nov. (with left fore leg). 3. *fallacidesertileonidum* sp. nov. 4. *dubiadesertileonidum* sp nov. Scale in μm, same (400 X) for all figures.

TAXONOMIC LIST

1. *Frankliniella anitahoffmannae* sp. nov.
2. *F. dubiadesertileonidum* sp. nov.
3. *F. fallacidesertileonidum* sp. nov.
4. *F. falsadesertileonidum* sp. nov.

Key to the species in the *Frankliniella anitahoffmannae* species assemblage

1. Interocellar setae (pair III) between hind ocelli 2
- Interocellar setae (pair III) between the fore and hind ocelli, as long as one ocellar diameter and postocular setae IV. Head yellow . . . . . *F. anitahoffmannae* sp. nov.
2. Interocellar setae longer (2.0-3.0 times) than ocelli. Head dark brown 3
- Interocellar setae very much reduced: shorter than ocelli and postocular setae IV. Head yellow . . . . . *F. fallacidesertileonidum* sp. nov.
3. Pronotum almost smooth, except for some transverse and faint striae in posterior margin; chaetotaxy: median transverse row with two very minute setae, four minor subposteromarginals . . . . . *F. falsadesertileonidum* sp. nov.
- Pronotum sculptured with transverse and confluent striae; chaetotaxy: median transverse row with three setae, six subposteromarginals . . . *F. dubiadesertileonidum* sp. nov.

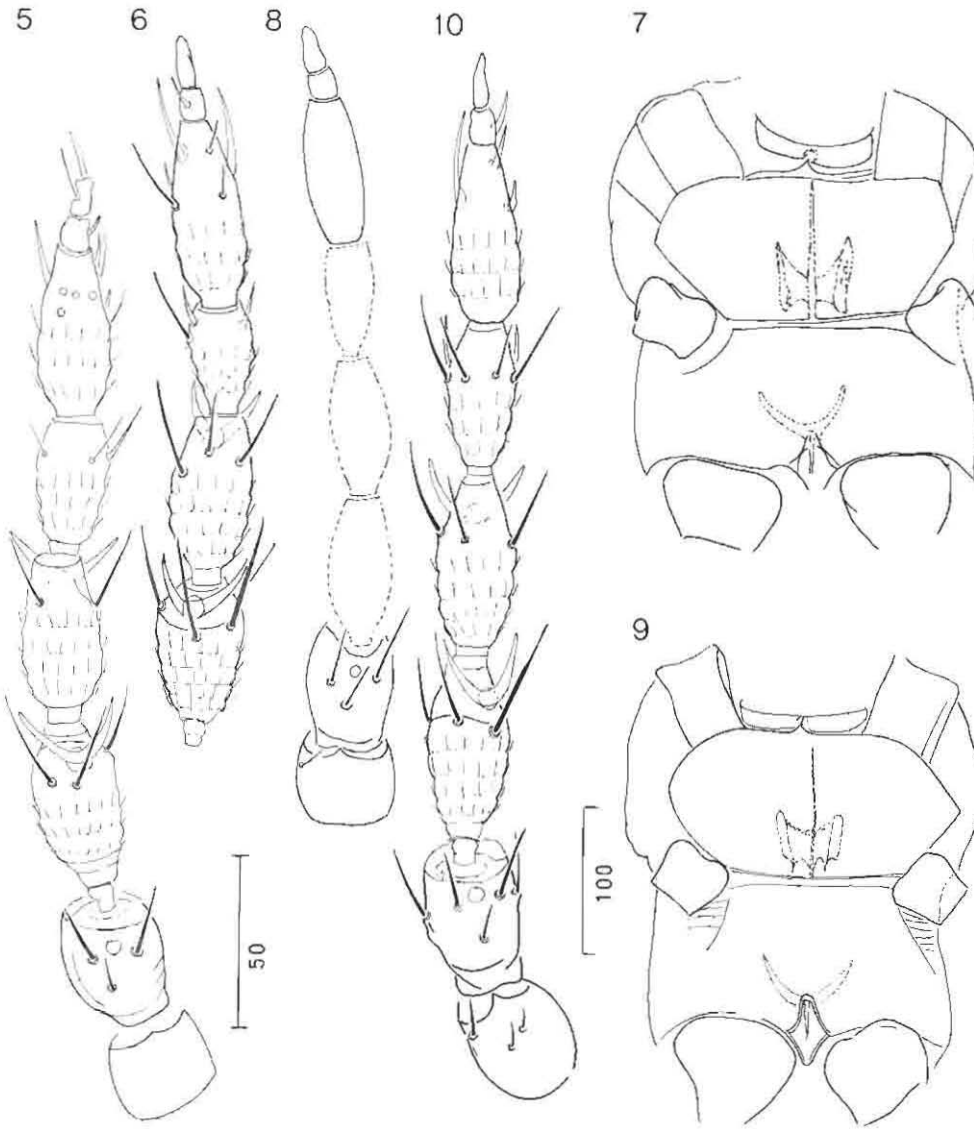
***Frankliniella anitahoffmannae* sp. nov.**

(Figs. 2, 5, 11, 16, 19, 26, 28)

Frankliniella sp. 1 (near *fusca*) Johansen & Mojica, 1996: 264.

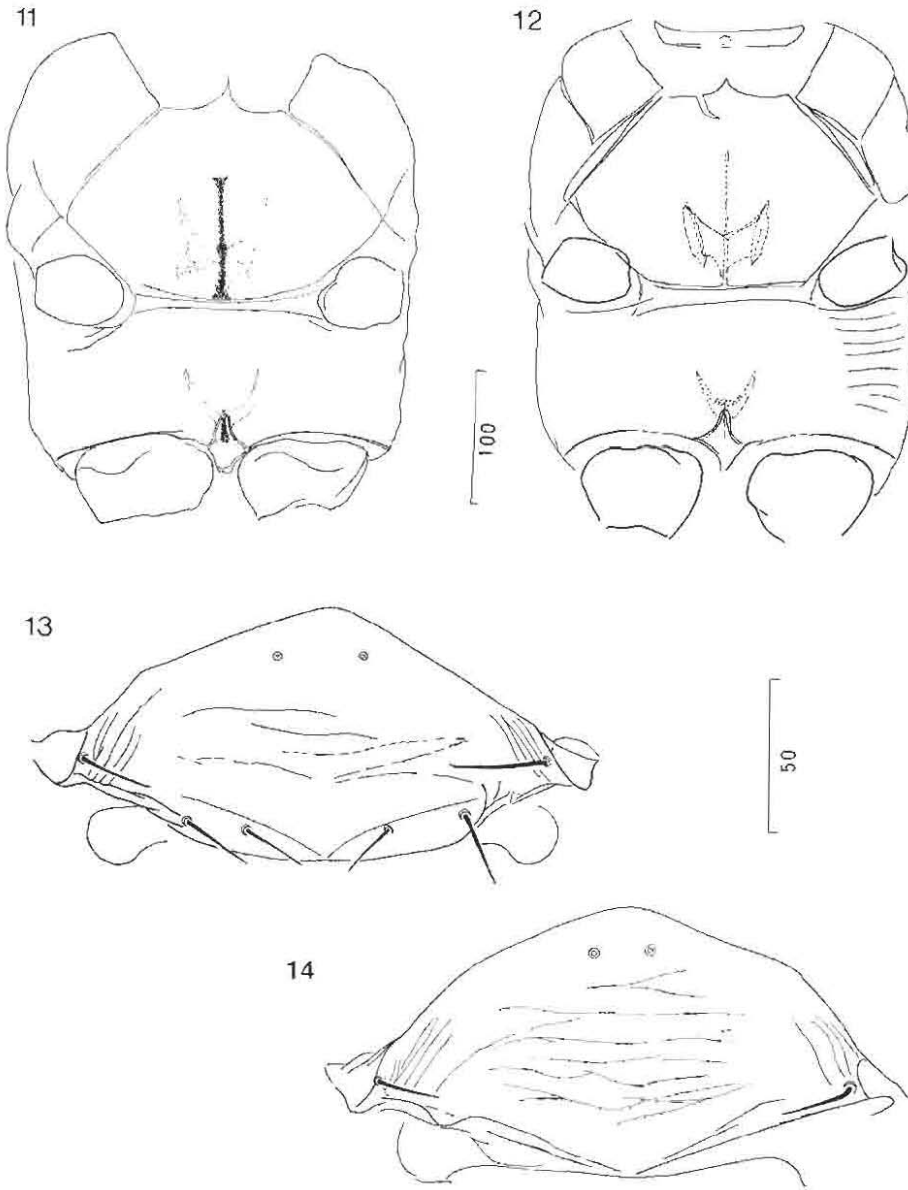
Female. Body bicolored: head predominantly yellow, brownish in vertex and cheeks; dark chestnut-brown in thorax and abdomen. Antennal segments: I-II, VI-VIII dark chestnut-brown; III whitish-yellow; IV-V whitish-yellow basally, darkened with brown in apical third and half respectivelly. Fore femora yellow, brown in basal one third; middle and hind femora brown, yellow in both extremes; all tibiae and tarsi yellow. Fore wings brown in extreme base and at middle, the rest whitish-yellow; hind wings whitish. Ocellar crescents orange. Body setae dark brown. Head in dorsal aspect (Fig. 1), broader (1.38 times) than long at middle. Compound eyes not protruding. Chaetotaxy as follows: anteocellars (pairs I-II) shorter than ocellar diameter; interocellars (pair III) between fore and hind ocelli, slightly longer than ocelli, but subequal in length to postocular IV. Antennal segments (Fig. 5) typical in the group. Pronotum trapezoidal (Fig. 2), sculptured with faint transverse and confluent striae in the anterior one half and posterior margin; chaetotaxy as follows: a median transverse curved row of three setae; four subposteromarginals, the median pair advanced. Pterothorax; pterosternum, mesosternal plate transverse and hexagonal, furca strong (Fig. 11); mesonotum (Fig. 16) oblong, with faint transverse striae; metanotum (Fig. 19). Abdomen; tergites VIII-X (Fig. 26); tergite IX major caudal setae IX i-iii as long as tergite VIII.

Measurements (Holotype ♀ in μm). Body length: 1.32 mm.



Figures 5-10

Dorsal views of the antennae; Figs. 7, 9 Ventral views of the pterosterna from *Frankliniella* spp. adult ♀ holotypes. 5. *anitahoffmannae* sp. nov. (right). 6. *falsadesertileonidum* sp. nov. (left; segments III-VIII); 7. *Idem*. 8. *fallacidesertileonidum* sp. nov. (right); 9. *Idem*. 10. *dubiadesertileonidum* sp. nov (right). Scales in μm, same (400 X) for figures 7, 9; same (1000 X) for figures 5-6, 8, 10.



Figures 11-14

Ventral views of the pterosterna; Figs 13-14 Dorsal views of the mesonota from *Frankliniella* spp. adult ♀ holotypes. 11. *anitahoffmannae* sp. nov. 12. *dubiadesertileonidum* sp. nov. 13. *falsadesertileonidum* sp. nov. 14. *fallacidesertileonidum* sp. nov. Scales in μm, same (400 X) for figures 11-12; same (1000 X) for figures 13-14.

Head dorsal length: 104. Width at eyes: 140, behind eyes: 140, at middle: 144, at base: 140. Chaetotaxy, intocc: 20, postoc: i-iii 10, IV 14. Compound eyes, length: 60, width: 50; ocelli, fore: 16, hind: 16. Antennal segments, length (width): I 26 (24), II 30 (26), III 46 (22), IV 40 (20), V 34 (18), VI 44 (18), VII 10 (8), VIII 12 (6). Thorax; pronotum, length: 124, width at middle: 170; chaetotaxy, major setae: AA 50. AM 52; PA, outer: 60, inner: 66; minor setae: am 12; pm i: 16, ii : 40, iii: 20. Mesothorax, width: 200; metathorax, width: 240. Fore wings width, basal: 60, middle: 50; vein chaetotaxy, fore: 21, hind: 16. Abdomen; width at segment IV: 240. Tergite IX setae, IX i: 104, IX ii: 110. Tergite X setae, X i: 120.

Material examined. Holotype ♀. MEXICO; HIDALGO: Sierra de Pachuca (Volcanic Range), Atotonilco El Grande, 2138 m.; 30-X-1976; in flowers of *Helianthus* sp. (Roberto M. Johansen), in IBUNAM.

Comments. *Frankliniella anitahoffmannae* sp. nov., is different from the adults of the other three species in the assemblage, because it has the interocellar setae (pair III) between fore and hind ocelli (within the ocellar triangle), this is the intermediate position according to Moulton (1948). Alternativelly, the other three species have the interocellar setae between the hind ocelli (third position according to Moulton Loc. cit.). See comments in Frankliniella fallacidesertileonidum.

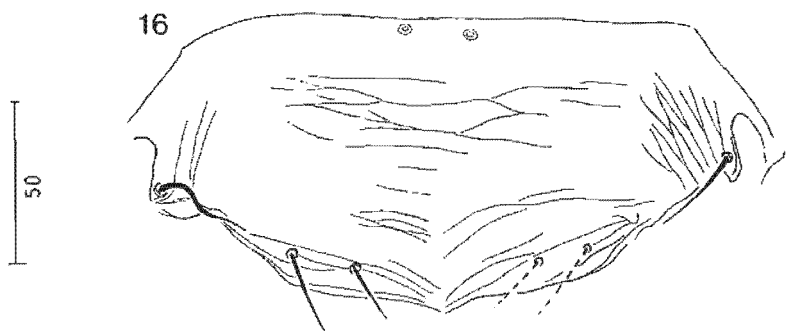
We the authors are very happy to name this species honouring our dear friend and colleague Dr. Anita Hoffmann Mendizábal, the great Mexican Acarology master.

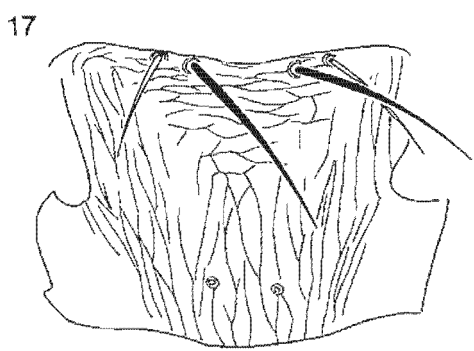
Frankliniella dubiadesertileonidum **sp. nov.**

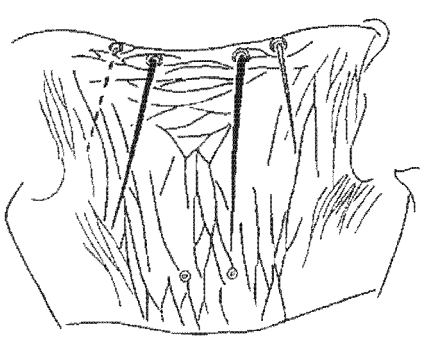
(Figs. 4, 10, 12, 15, 20-21, 27-28)

Female. Body color dark chestnut-brown, with abundant orange subhypodermal pigment, except: antennal segments III-V white; VI dark brown, whitish yellow in both extremes; VII brownish in basal one half, the rest whitish-yellow; VIII whitish-yellow. Fore legs: femora brown in basal one half, the rest whitish-yellow, tibiae clear yellow; middle legs: femora brown, whitish-yellow in distal end, tibiae brown at middle, whitish-yellow in both extremes; hind legs: femora dark brown, tibiae brown at middle, whitish-yellow in both extremes. All tarsi whitish-yellow. Fore wings brown in extreme base and at middle, whitish in two transverse bands: one subbasal, the other in apical third; hind wings white. Ocellar crescents red. Body setae brown. Head in dorsal view (Fig. 4), broader (1.61 times) than long at eyes; cheeks sinuous. Compound eyes not protruding. Chaetotaxy as follows: anteocellars (pairs I-II) shorter than ocellar diameter; interocellars (pair III) between hind ocelli, longer (three times of an ocellar diameter) than ocelli and postocular setae IV. Antennal segments (Fig. 10) typical in the group, III longer than IV-VI. Pronotum (Fig. 4), broader (1.5 times) than long at middle; sculptured with open transverse and confluent striae; chaetotaxy as follows: a median transverse row of three setae; five subposteromarginals, the median pair advanced. Pterothorax; pterosternum, mesosternal plate transverse and hexagonal, its furca stronger than the matafurca; mesonotum (Fig. 15)

oblong-hexagonal; metanotum (Fig. 20). Abdomen; tergite I (Fig. 21); tergites VIII-X (Fig. 27); tergite IX major caudal setae IX i as long as tergite VIII. IX ii, IX iii longer.

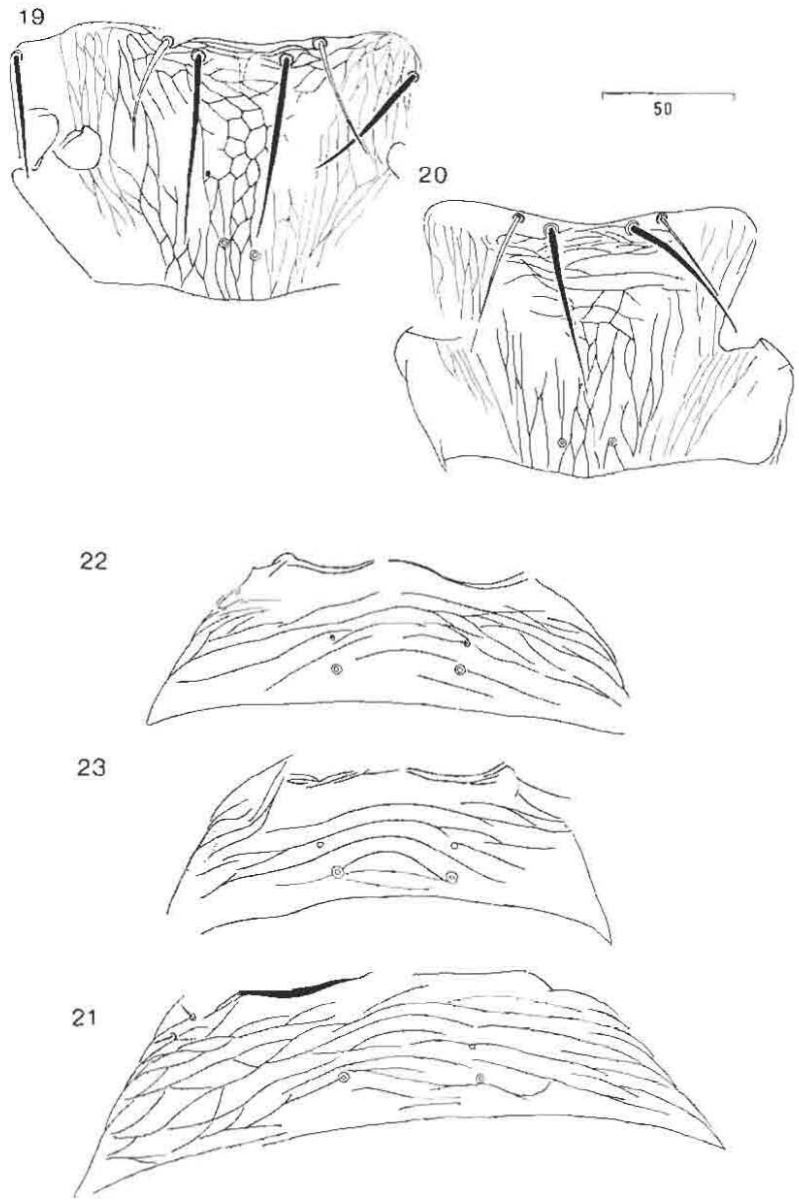






Figures 15-18

Dorsal views of the mesonota; Figs 17-18 Dorsal views of the metanotal scutum from *Frankliniella* spp. adult ♀ holotypes. 15. *dubiadesertileonidum* sp. nov. 16. *anitahoffmannae* sp. nov. 17. *falsadesertileonidum* sp. nov. 18. *fallacidesertileonidum* sp. nov. Scale in μm, same (1000 X) for all figures.



Figures 19-23

Dorsal views of the metanotal scutum; Figs. 21-23 Dorsal views of the tergite I from *Frankliniella* spp. adult ♀ holotypes. 19. *anitahoffmannae* sp. nov. 20. *dubiadesertileonidum* sp. nov. 21. *Idem*. 22. *falsadesertileonidum* sp. nov. 23. *fallacidesertileonidum* sp. nov. Scale in μm, same (1000 X) for all figures.

Measurements (Holotype ♀ in μm). Body length: 1.37 mm.

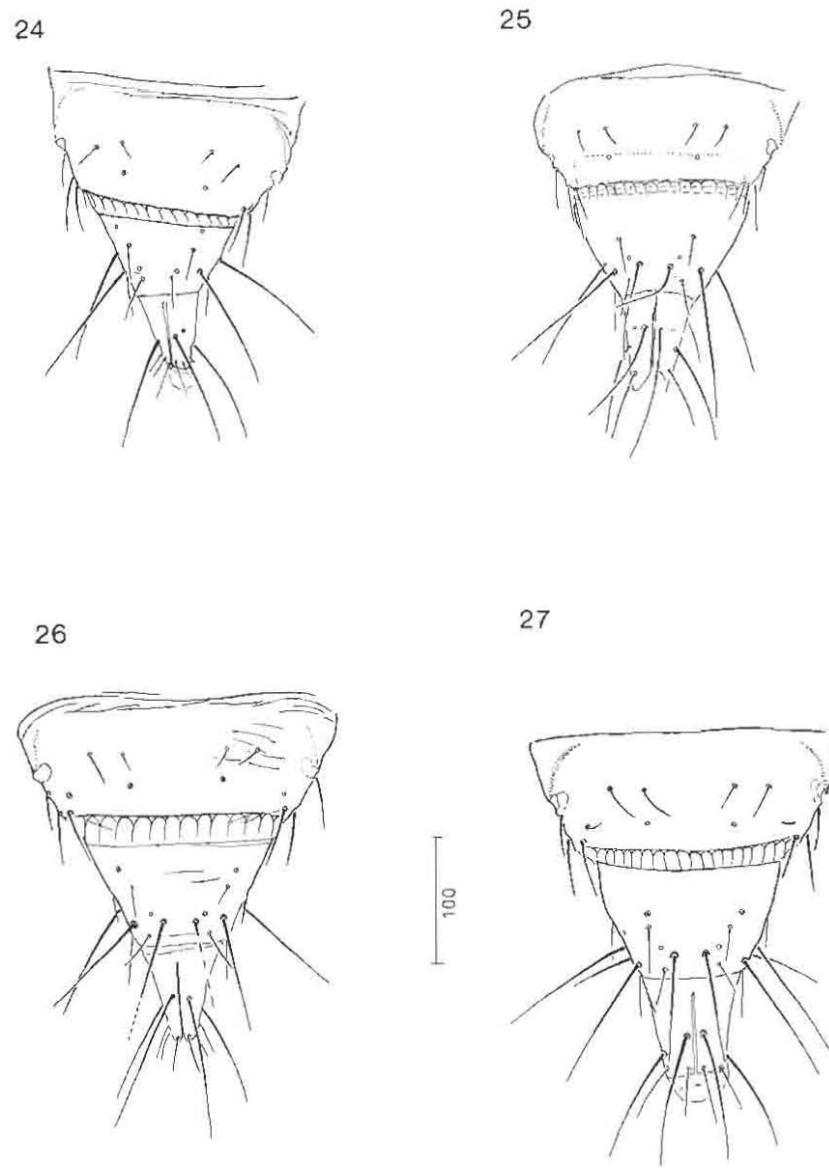
Head dorsal length: 88. Width at eyes: 142, behind eyes: 140, at middle: 138, at base: 130. Chaetotaxy, intocc: 30, postoc: i-iii 10, IV 20. Compound eyes, length: 60, width: 50; ocelli, fore: 14, hind: 12. Antennal segments, length (width): I 24 (24), II 32 (22), III 50 (20), IV 46 (20), V 36 (18), VI 42 (18), VII 10 (8), VIII 12 (6). Thorax; pronotum, length: 120, width at middle: 182; chaetotaxy, major setae: AA 50, AM 42; PA, outer: 52, inner: 66; minor setae: am 14; pm i: 18, ii: 38, iii: 16. Mesothorax, width: 260; metathorax, width: 246. Fore wings width, basal: 90, middle: 60; vein chaetotaxy, fore: 23, hind: 18. Abdomen; with at segment IV: 288. Tergite IX setae, IX i: 68, IX ii: 90. Tergite X setae, X i: 100.

Material examined. Holotype ♀. MEXICO; MORELOS: Tepoztlán (Volcanic Range), 1701 m.; 17-XI-1973; in flowers of *Tithonia tubaeiformis* (Roberto M. Johansen), in IBUNAM

Comments. *Frankliniella dubiadesertileonidum* sp. nov., is near to the adults of *F. falsadesertileonidum*, in the dark brown body color, and the long interocellar setae (pair III) between hind ocelli. However, *F. dubiadesertileonidum* is a larger and stronger species, with an almost completly sculptured pronotum, with a median transverse row of three setae. Alternativelly, in *F. falsadesertileonidum* the pronotum is almost smooth, and with a median transverse row of two setae. Etimology: from latin, dubia = doubt; desertileonidum = from the Desierto de los leones National Park (a similar species).

***Frankliniella falsadesertileonidum* sp. nov.**
(Figs. 1, 6-7, 13, 17, 24, 28)

Female. Body color dark chestnut (lighter in head), with abundant orange subhypodermal pigment, except: antennal segments III-V yellowish-white; VI dark yellowish-brown, white in basal extreme; VII-VIII yellowish-brown. Fore legs, femora yellowish-brown, whitish-yellow in both extremes; tibiae white; middle legs, femora yellowish-brown, whitish-yellow in both extremes; tibiae yellowish-brown, whitish-yellow in both extremes; hind legs, femora yellowish-brown; tibiae yellowish-brown, whitish-yellow in both extremes. All tarsi white. Fore wings brown in extreme base and middle, the rest white; hind wings whitish. Ocellar crescents crimson-red. Body setae dark brown. Head in dorsal aspect (Fig. 1), broader (1.61 times) than long at middle. Compound eyes slightly protruding. Chaetotaxy as follows: anteocellars (pairs I-II) minute and shorter than ocellar diameter; interocellars (pair III) between fore and hind ocelli, about three ocellar diameters in length. Antennal segments (Fig. 6) typical in the group, VI longer than III-V. Pronotum (Fig. 1) almost smooth, with some transverse posteromarginal striae; chaetotaxy as follows: a median transverse row of two setae; four subposteromarginals. Pterothorax; pterosternum, mesosternal plate very oblong (Fig. 7); mesonotum (Fig. 13) nearly pentagonal in outline; metanotum (Fig. 17). Abdomen; tergites VIII-X (Fig. 24); tergite IX major caudal setae IX i-iii as long as tergite VIII.



Figures 24-27

Dorsal views of the tergites VIII-X from *Frankliniella* spp. adult ♀ holotypes. **24.** *falsadesertileonidum* sp. nov. **25.** *fallacidesertileonidum* sp. nov. **26.** *anitahoffmannae* sp. nov. **27.** *dubiadesertileonidum* sp. nov. Scale in μm, same (400 X) for all figures.

Measurements. (Holotype ♀ in μm). Body length: 1.08 mm.

Head dorsal length: 84. Width at eyes: 134, behind eyes: 132, at middle: 132, at base: 130. Chaetotaxy, intocc: 30, postoc: i-iii 6.4, IV 18. Compound eyes, length: 50, with: 40. Ocelli, fore: 14, hind: 12 Antennal segments, length (width): I 24 (24), II 34 (24), III 42 (22), IV 40 (20), V 30 (18), VI 46 (18), VII 8 (6), VIII 10 (4). Thorax; pronotum, length: 106, width at middle: 154; chaetotaxy, major setae: AA 48, AM 38; PA, outer: 52, inner: 52; minor setae: am 10; pm i: 14, ii: 28, iii: 10. Mesothorax, width: 224; metathorax, width: 202. Fore wings width, basal: 90, middle: 54; vein chaetotaxy, fore: 23, hind: 16. Abdomen; width at segment IV: 228. Tergite IX setae, IX i: 60, IX ii: 90. Tergite X setae, X i: 94

Material examined. Holotype ♀, Paratype ♀. MEXICO; MICHOACAN: Sierra de Mil Cumbres (Volcanic Range), on road Méx-15, km 188 (Morelia-Toluca), 2800 m.; 23-IV-1977 (Holotype ♀); in flowers of *Senecio roldana* within *Abies-Pinus-Quercus* Forest (Roberto M. Johansen), in IBUNAM. DISTRITO FEDERAL: Sierra de Ajusco (Volcanic Range), Cañada de Contreras, 2800m.; 27-III-1975; (Paratype ♀); in flowers of *Eupatorium* sp. within *Quercus* spp. Forest (Roberto M. Johansen), in IBUNAM.

Comments. See comments in *Frankliniella dubiadesertileonidum*. Etimology: from latin, falsa = false; desertileonidum = from the Desierto de los leones National Park (a similar species).

Frankliniella fallacidesertileonidum sp. nov.

(Figs. 3, 8-9, 14, 18, 23, 25, 28)

Female. Body bicolored: head clear yellow; dark chestnut-brown in thorax and abdomen. Antennal segments: I-II dark chestnut-brown; III-VIII whitish. Fore legs, femora yellowish-white, lighter towards distal end: tibiae white; middle legs, femora yellowish-brown, white in both ends; tibiae yellow, white in both ends; hind legs, femora yellowish-brown, white in both ends; tibiae yellow, white in both ends. All tarsi white. Fore wings brown in extreme base and middle, the rest white; hind wings whitish. Ocellar crescents orange. Body setae yellowish-brown. Head in dorsal aspect (Fig. 3), broader (1.71 times) than long at middle; cheeks sinuous; compound eyes slightly protruding. Chaetotaxy as follows: anteocellars (pairs I-II) minute and shorter than ocellar diameter; interocellars (pair III) very reduced: shorter than ocellar diameter and postocular IV. Antennal segments (Fig. 8) typical in the group, III and VI subequal in length: Pronotum (Fig. 3) almost smooth, except for some faint transverse and confluent striae at center and some strong striae in posterior margin; chaetotaxy as follows: a median transverse row of two setae; three subposteromarginals: Pterothorax (Fig. 9); mesonotum (Fig. 14); metanotum (Fig. 18). Abdomen; tergite I (Fig. 23); tergites VIII-X (Fig. 25); tergite IX major caudal setae IX i & IX iii as long as tergite VIII, IX ii longer.

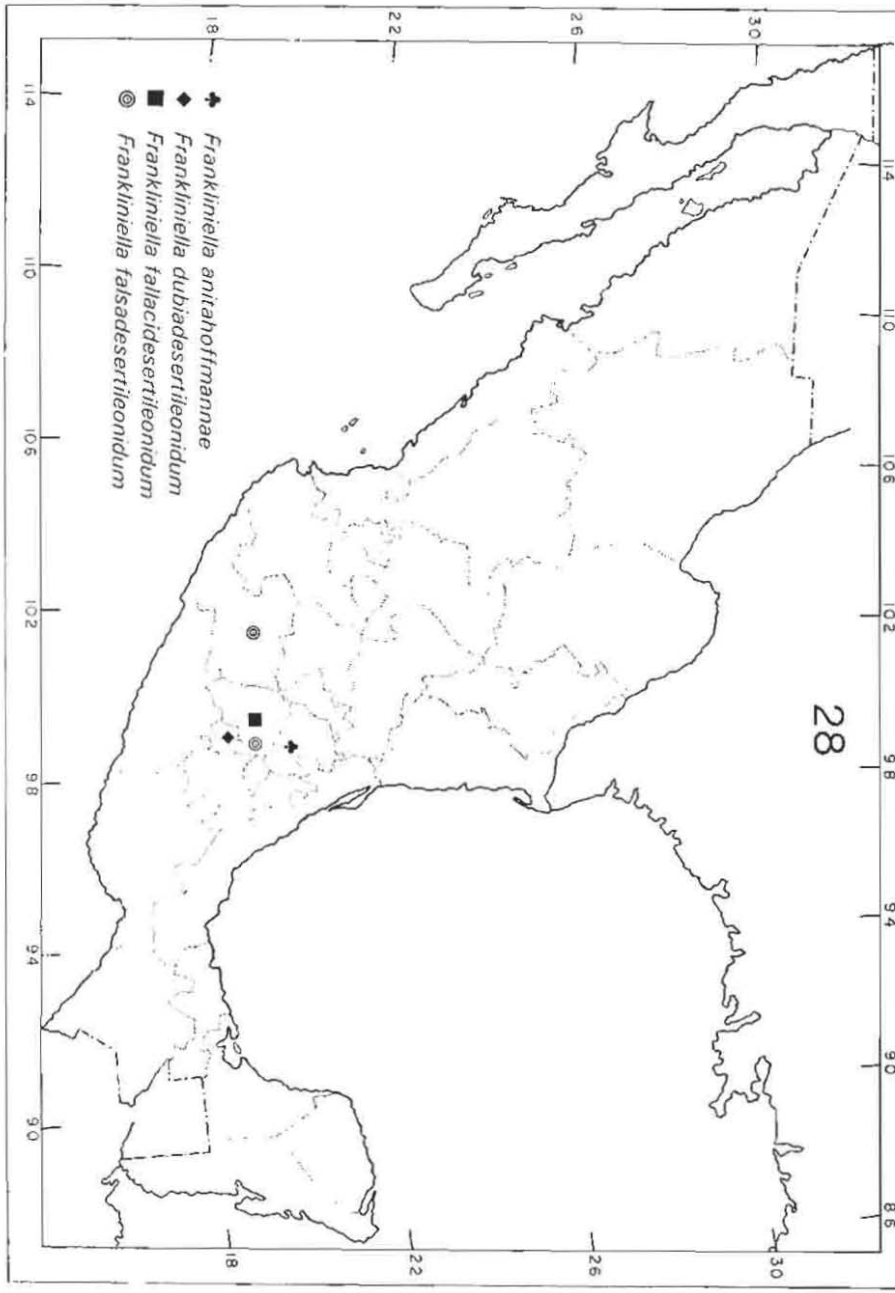


Figure 28
Map

Measurements. (Holotype ♀ in μm). Body length: 0.990 mm.

Head dorsal length: 78. Width at eyes: 134, behind eyes: 132, at middle: 134, at base: 124. Chaetotaxy, intocc: 10, postoc: i-iii 10, IV 16. Compound eyes, length: 54, width: 40. Ocelli, fore: 14, hind: 12. Antennal segments, length (width): I 22 (24), II 32 (24), III 38 (20), IV 34 (18), V 28 (16), VI 38 (14). Thorax; pronotum, length: 104, width at middle: 158; chaetotaxy, major setae: AA 30, AM 20; PA, outer: 48, inner: 44; minor setae: am 9; pm i: 6.6, ii: 27, iii: 6.6. Mesothorax, width: .210; metathorax, width: 182. Abdomen, width at segment IV: 232. Tergite IX setae, IX i: 64, IX ii: 90. Tergite X setae, X i: 94.

Material examined. Holotype ♀. MEXICO; DISTRITO FEDERAL: Sierra de Ajusco (Volcanic Range), Cañada de Contreras, 2900 m.; 27-III-1975; in flowers of *Eupatorium* sp. within *Quercus* spp. Forest (Roberto M. Johansen), in IBUNAM.

Comments. *Frankliniella fallacidesertileonidum* sp. nov., is different from the adults of *F. dubiadesertileonidun* and *F. falsadesertileonidum* because of the followings characters: the yellow head, and the very reduced (shorter than ocellar diameter) interocellar (pair III) setae. This last character, is interpreted here as a shared one with the species in the "Minuta group", in the sense of Retana & Mound (1994). However, a carefull examination of the head and antennal segments (III-VI long, not moniliform) shape, together with the long stout major pronotal anteroangular and anteromarginal setae, are characters that relate the "Anitahoffmannae assemblage" to the "Intonsa group" satisfactorily. Alternativelly, in the adults of *Frankliniella dubiadesertileonidum* and *F. falsadesertileonidum*, the head is dark brown, and the interocellar setae are longer than ocellar diameter. Etimology: from latin, fallax, acis = fallacy; desertileonidum = from the Desierto de los leones National Park (a similar species).

Geographic distribution. The four species in the *Frankliniella anitahoffmannae* specific assemblage, are distributed in the Mexican Volcanic Range (Fig. 28), as follows: Sierra de Pachuca, Hidalgo (2138 m.); Sierra de Ajusco, Distrito Federal (2800-2900 m.); Sierra de Tepoztlán, Morelos (1170 m.), and in the Sierra de Mil Cumbres, Michoacán (2800 m.). *Frankliniella falsadesertileonidum* and *F. fallacidesertileonidum* are sympatric and synchronic species.

Some ecologic data. The four species included in the *Frankliniella anitahoffmannae* assemblage, are commonly found in flowers of Asteraceae of the genera: *Eupatorium, Helianthus, Senecio* and *Tithonia*. The species sampled in *Eupatorium* and *Senecio* live in higher altitudes: 2800-2900 m. in *Quercus, Pinus, Abies* forest. The species collected in *Helianthus*, in a *Quercus-Pinus* Forest modified with an agroecosystem (2138 m.), whereas the species taked in *Tithonia* in a Tropical Deciduous Forest, modified with an agroecosystem (1170 m.).

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LITERED CITED

Johansen, R.M. & A. Mojica-Guzmán, 1996. Thysanoptera. *In*: J. Llorente, A.N. García & E. González-Soriano (Eds.) *Biodiversidad, taxonomía y biogeografía de artrópodos de México: hacia una síntesis de su conocimiento.* Instituto de Biología, Facultad de Ciencias, UNAM. & Comisión Nacional para el conocimiento y uso de la Biodiversidad, México: 213-245.

Karny, H. 1910. Neue Thysanopteren der Wiener Gegend. *Mitt. Nat. Ver. Univ. Wien.* 2: 41-57.

Mayr, E. & P.P. Ashlock, 1991. *Principles of systematic Zoology*. 2nd. Ed. Mc Graw-Hill, Inc. New York. 475 pp.

Moulton, D. 1948. The genus *Frankliniella* Karny, with keys for the determination of species (Thysanoptera). *Rev. Entomol. (Rio de Janeiro)* 19(1-2): 55-114.

Retana, A. & L.A. Mound. 1994. Thrips of the *Frankliniella minuta* group (Insecta: Thysanoptera) in Costa Rican Asteraceae flowers. *Rev. Biol. Trop.* 42(3): 639-648.

Watson, J.R. 1942. Two new *Frankliniellas* from Mexico. *Florida Ent.* 25(3): 43-46.

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