THE MEXICAN \textit{FRANKLINIELLA DESERTILEONIDUM} WATSON SPECIES ASSEMBLAGE, IN THE "INTONSA GROUP" (INSECTA, THYSANOPTERA: THRIPIDAE)

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RESUMEN

Se hace la revisión de la especie neovolcánica mexicana \textit{Frankliniella desertileonidum} Watson, con base en un Paratipo y material nuevo. Lo anterior permitió la reconsideración de la también especie mexicana de la Sierra Madre Oriental \textit{F. oneillae} Johansen, como una especie diferente y válida con respecto a \textit{F. desertileonidum}. Con base en lo anterior, se adicionan tres especies nuevas de la Sierra Madre Oriental. La definición de cada especie, ha permitido el establecimiento de relaciones de afinidad con base en caracteres morfológicos compartidos, lo que las define y agrupa en un ensamble específico. Se incluyen ilustraciones morfológicas de todas las especies, de cabeza, antenas, tórax y abdomen.

Palabras Clave: Thysanoptera, Ensamble específico \textit{Frankliniella desertileonidum}, Taxonomía, Nuevas especies, Distribución, México.

ABSTRACT

The review of the Mexican Neovolcanic species \textit{Frankliniella desertileonidum} Watson was carry out herein, based in a Paratype, as well as new material. This allowed the reconsideration of \textit{F. oneillae} Johansen from the Sierra Madre Oriental, as a different and valid species, with respect to \textit{F. desertileonidum}. This supported the determination of three new more species from the Sierra Madre Oriental. All these elements derived in the establishment of relationships supported with shared morphologic characters between the five species. This allowed the grouping in a specific assemblage. Morphologic illustrations of the head, antennae, thorax and abdomen of all the species, are included. Key Words: Thysanoptera, \textit{Frankliniella desertileonidum} species assemblage, Taxonomy, New species, Distribution, Mexico.

INTRODUCTION

The genus \textit{Frankliniella} was created by Karny (1910). Later, Hood (1925) divided the genus in four specific groups: "cephalica", "intonsa", "minuta" and "tritici"; this division was based in the morphology of the interocellar setae (pair III); the dorsal aspect of apex (produced or not) in antennal segment II; the morphology of the pedicel in antennal segment III; the chaetotaxy in the male tergite IX.
Moulton (1948), in his full revision of the genus *Frankliniella* followed the previous group division of Hood (*Loc. cit.*). However, the groups cephalica and tritici were treated as series in his Tritic-Cephalica group. He divided the "Intonsa group" in three series: "Intonsa", "Insularis" and "Tenuicornis". He introduced the interocellar setae position classification. In the Intonsa group (Intonsa series), he included 89 names (as species, varieties or forms); within this number, 25 were Mexican species.

Bryan and Smith (1956), created the first "specific complex" in their review of the *Frankliniella occidentalis* (Pergande) complex in California. Jacot-Guillarmod (1974) catalogued 151 World species: from them, 30 were Mexican.

*Frankliniella oneillae* was described by Johansen (1979). The later synonymy of *F. oneillae* under *F. desertileonidum* Watson, by Mound and Marullo (1996), together with the discovery (cf. Johansen & Mojica, 1996) of three related additional new Mexican species (from high mountains), made necessary this review, to allow a reconsideration of *Frankliniella oneillae* Johansen as a different and valid species with respect to *F. desertileonidum* Watson, and the final integration of the five species into a "species assemblage".

The definition of *Frankliniella desertileonidum* Watson and its four related species as a "specific assemblage" within the Intonsa Group, was possible by means of the recognition of several shared morphologic characters. One of the remarkable characters, is the lack of the postocular setae i (this fact is supported by the evidence found in the Holotype ♀ of *Frankliniella brevisaetaeonillae* (Fig. 4), which shows the complete left postocular setae row: i-iii, IV, whereas the right row lacks setae i: ii-iii, IV. This means that the postocular setae i once existed, as in most of the species in the Intonsa Group, but later it was lost), thus giving the formula: ii-iii, IV; the other important character is the fore wings color: dark chestnut-brown, with two clear transverse bands, one subbasal, the other apical. The lack of postocular setae i is a shared character with *Frankliniella aurea* Moulton; however, this species has clear yellow fore wings, body color is mainly yellow, like in *F. occidentalis* (Pergande). Since the species number in the Intonsa group is still increasing, the species assembling is a good classifying solution. The terms assemblage, complex and group are used here as neutral terms, according to Mayr and Ashlock (1991).

**MATERIAL AND METHODS**

The illustrations from adults of each of the species, are realistic microscopic interpretations that were done using a camera-lucida equipment and two magnifications: 400 and 1000 X.
HEAD

intonc = 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 deserticola Watson SPECIES ASSEMBLAGE

Diagnosis. Small species (females: 1.2-1.5 mm; males: 0.900-1.0 mm in length) in the Intonsa group. Body color predominantly dark chestnut-brown (yellow in tarsi), with abundant orange subhypodermal pigment. Antennal segments III-V yellow, sometimes darker in apex. Fore wings dark chestnut-brown, with two clear transverse bands: one at the base, the other at apex. Ocellar crescents orange to red. Body setae dark brown. Head (Figs. 1-7, 9) broader than long in anterior one half, middle or at base; occiput sculptured with open parallel striae, which become confluent at sides. Postocular setae formula: i-iii, IV. Compound eyes ellipsoidal, slightly ot not protruding. Antennal segments (Figs. 8, 10, 12, 14) typical in the group, III with slightly fungiform pedicel; III-V globose elongate; VI pyriform-elongate. Mouth-cone pointed, shorter to longer than dorsal length of head. Pronotum (Figs. 1-7, 9) smooth to sculptured with faint transverse and confluent striae specially in both anterior and posterior margins and at center. Mesonotum (Figs. 16-19) oblong-hexagonal, with transverse open striae, becoming confluent at sides and center. Metanotal scutum (Figs. 20, 22-23, 25) with fine transverse striae in anterior margin, followed by equiangular to elongate polygons, and fine striae in both sides; median setae pair in anterior margin. Tergite VIII (Figs. 21, 24, 26-27, 30, 32), with a complete posteromarginal comb. Male with a small circular to slightly ellipsoid glandular area in each of sterna II-VII (Figs. 28-29, 31).

Specific differential characters. The following color and morphologic characters are useful in determining species: antennal segments III-VI color. Body size and proportions. The interocellar setae (pair III) length. The pronotal surface and chaetotaxy. The meso- and metanotal size and sculpture. The pterosternum, specially the mesosternal plate.
Figures 1-6

Dorsal views of the head and pronotum of adults from *Frankliniella* spp. 1. *oneillae* Johansen Paratype ♀; 2. *idem*, Paratype ♂ (head corrected). 3. *oneillana* sp. nov. Holotype ♂. 4. *brevisetaoneillae* sp. nov. Holotype ♀ (with left fore leg); 5. *idem*, Paratype ♂; 6. *zacualtipana* sp. nov. Holotype ♀ (with right leg). Scale in µm, same (400 X) for all figures.
Comments. This species assemblage is different from the others in the Intonsa group, because of the fore wings peculiar color, and the postocular setae formula: ii-iii, IV. The lack of one or more postocular setae is a frequent character in the Minuta group, according to Sakimura and O'Neill (1979).

The five studied species, still have scarce specimens for study. Frankliniella desertileonidum Watson was described with only two adult females: Holotype and Paratype; only one subsequent female was added in this study. Frankliniella oneillae Johansen has the largest Type series: 10 adults (7 ♀♀, 3 ♂♂), and a subsequent collection of eight females. Frankliniella brevisetaeoneillae is the second species known by adults of both sexes. However, Frankliniella oneileana and F. zacualtipana are still known by their adult females.

Relations with others assemblages within the Intonsa group. The Frankliniella desertileonidum Watson species assemblage, is different from the other (with dark colored body and fore wings) in the Intonsa group, in the following characters: a) The lack of postocular setae i; b) The fore wings dark brown with two clear transverse bands: basal and apical. The Frankliniella aurea Moulton assemblage, also shares the character of lacking the postocular setae i, but it has a yellow body and winged species, more close to the F. occidentalis (Pergande) assemblage.

Key for separating the Frankliniella desertileonidum and F. aurea assemblages within the Intonsa group

1 Postocular setae i wanting (ii-iii, IV, v-vi) .......................................................... 2
- Postocular setae i present (i-iii, IV, v-vi) .................................................... the other assemblages
2 Fore wings and body predominantly clear yellow ................. F. aurea assemblage
- Fore wings dark brown, with two clear transverse bands: basal and apical; body dark chestnut-brown .......................................................... F. desertileonidum assemblage

TAXONOMIC LIST

1. Frankliniella brevisetaeoneillae sp. nov.
2. " desertileonidum Watson
3. " oneillae Johansen
4. " oneileana sp. nov.
5. " zacualtipana sp. nov.

Key to the species in the Frankliniella desertileonidum species assemblage

1 Pronotum with a median transverse row of one to four setae, and one or two median subposteromarginal setae .......................................................... 2
- Pronotum without any median transverse and subposteromarginal setae .......................................................... F. oneillae Johansen
2 Intercellular setae (pair III) very long (4.0 times of an ocellar diameter) .......... 3
- Intercellular setae (pair III) short (0.35-2.3 times of an ocellar diameter .......... 4
Figures 7-9
Dorsal views of *Frankliniella desertileonidum* Watson. 7. Paratype ♀ head, pronotum and fore legs; 8. *Idem*, right antenna. 9. ♀ head (corrected) and pronotum. Scale in μm, same (400 X) for figures 7, 8; same (1000 X) for figure 9.
3 Tergite IX setae IX i-iii longer than tergite VIII. Occipital sculpture strong. Antennal segment III longer than VI ........................................... F. oneileana sp.nov.
- Tergite IX setae IX i-iii shorter than tergite VIII. Occipital sculpture somewhat faint. Antennal segment III shorter than IV. ................................... F. desertileonidum Watson
4 Antecellar setae (pairs I-II) shorter than ocelli. Interocellar setae (pair III) reduced (0.35-
1.0 times of an ocellar diameter) and almost subequal to postocular IV, both shorter than pronotal posteromarginal ii. Antennal segment VI dark brown with a clear subbasal ring .............................................................................. F. zacualtipana sp. nov.
- Antecellar setae (pairs I-II) longer than ocelli. Interocellar setae (pair III) moderately long
(2.0-2.3 times of an ocellar diameter), subequal or longer than postocular IV, both much
longer than pronotal posteromarginal ii. Antennal segment VI dark brown, clear yellow in
basal one third ................................................................. F. brevisaetaeoneillae sp. nov.

Frankliniella brevisaetaeoneillae sp. nov.
(Figs. 4-5, 11, 14, 20-21, 31-33)
Frankliniella sp. 2 (near oneillae Johansen); Johansen & Mojica, 1996: 264.

Female. Body with typical coloration: dark chestnut-brown, except: antennal segments III-V
yellowish-white, VI yellow in basal one third, the rest dark brown. Fore tibiae dark brown,
lighter in apex. All tarsi yellow. Fore wings dark brown, clear whitish in basal one fifth and
apex; hind wings white, with a dark brown median longitudinal vitta. Body setae blackish-
brown. Ocellar pigment red. Head in dorsal aspect (Fig. 4), broader (1.5 times) than long
at middle, and with convex cheeks; occiput sculptured with parallel open striae, confluent
at sides. Chaetotaxy as follows: antecellars (pairs I-II) slightly longer than ocelli; interocellars (pair III) shorter than postocular IV. Antennal segments (Fig. 14) III-IV slightly
shorter than VI. Mouth-cone longer than dorsal length of head. Pronotum (Fig. 4) broader
(1.37 times) than long; its surface sculptured with transverse an confluent striae in both
anterior and posterior margins and at center; chaetotaxy as follows: major anteroangulars
and anteromarginals short: slightly longer than posteromarginals ii; inner posteroangulars
longer than outers; median transverse row with one to three; one or two subposteromarginals. Pterothorax; mesonotum (Fig. 18), metanotum (Fig. 23). Tergites VIII-
X (Fig. 24), posteromarginal comb in VIII, with shorter microtrichia at middle.

Measurements (Holotype 9 in μm). Body length: 1.4 mm.

Head dorsal length: 100. Width at eyes: 144, behind eyes: 146, middle: 152, basal: 150.
Ocelli, fore: 10, hind: 14. Antennal segments, length (width): I 22 (28), II 30 (24), III 40
(22), IV 42 (20), V 36 (16), VI 44 (18), VII 8 (6), VIII 12 (4). Thorax; pronotum, length:
134; width at middle: 184. Chaetotaxy, major setae: AA 40, AM 26; PA, outer: 50, inner:
56; minor setae, am: 10; pm i: 12, ii: 30, iii: 10. Mesothorax, width: 220; metathorax,
width: 246. Fore wings, width at base: 80, middle: 50; veins chaetotaxy, fore: 20, hind:
Figures 10-15
Figures 16-19

Male (Figs. 5, 31-32). Virtually as adult female, but smaller and slender. Pterothorax light brown; fore tibiae are yellow in both ends, whereas middle and hind tibiae only in distal end. Head (Fig. 5) broader in posterior one half; pronotum (Fig. 5) more smooth at center.

Measurements (Paratype ♂ in µm). Body length: 0. 900 mm.


Material examined: Holotype ♀; paratypes: 3 ♀♂, 1 ♂. MEXICO; NUEVO LEON: Cerro El Potosí (Sierra Madre Oriental), 8 km NW of 18 de marzo, 2200 m.; 26-VII-1977; beating Pinus and Quercus foliage (A.N. García), in IBUNAM.

Comments. Adults of Frankliniella brevistaetaeoneillae sp. nov. and F. zacualtipana sp. nov., have the shortest intercellular and postocellar IV setae in the assemblage. However, brevistaetaeoneillae is a more robust species; the intercellular setae are longer than posteromarginal i; the antennal segment VI is a clear yellow in basal one third; the pronotum is more sculptured. Alternatively, in zacualtipana the intercellular setae are very reduced and shorter than posteromarginal i; the antennal segment VI is dark brown with a clear subbasal ring; the pronotum is smooth at center.

Frankliniella desertileonidum Watson

(Figs. 7-9, 15, 19, 25-26, 33)

Frankliniella desertileonidum Watson, 1942: 45
Frankliniella desertileonidum Watson; Moulton, 1948: 74, 99
Frankliniella desertileonidum Watson; Jacot-Guillarmod, 1974: 743
Frankliniella desertileonidum Watson; Johansen & Mojica, 1996: 264
Frankliniella desertileonidum Watson; Mound & Marullo, 1996: 136

Female redescription based in one Paratype ♀ and one non Type ♀.

Body with typical coloration, except: antennal segments, III completely whitish-yellow or darkened with brown in apical one third; IV yellowish-white; V completely yellow or darkened with light brown in apical one half; VI dark brown with a clear sub-basal ring. Legs; all femora with yellow trochanters; fore tibiae yellow in both ends; hind tibiae yellow in distal end. All tarsi yellow. Fore wings dark brown, clear in basal one fifth and in apical two fifths. Ocellar pigment red. Head in dorsal aspect (Figs. 7, 9) broader (1.26 times) than long at
middle, and narrower towards base; occiput sculptured with fine parallel striae, confluent at sides. Chaetotaxy as follows: anteocellar (pairs I-II) longer than ocelli; interocellar (pair III) long (3.5-4.0 times of an ocellar diameter). Antennal segments (Fig. 8) IV and VI subequal in length, and shorter than III. Mouth-cone as long as dorsal length of head. Pronotum (Figs. 7, 9) broader (1.23 times) than long; its surface sculptured with fine, transverse and confluent striae; chaetotaxy as follows: anteroangulars longer than anteromarginals; inner posteroangular longer than outer; minor setae: two anteromarginals; a median transverse row of two to three setae; a pair of median transverse subposteromarginals. Pterothorax; mesonotum (Fig. 19), metanotum (Fig. 25); pterosternum (Fig. 15). Abdomen; tergite IX major caudal setae, shorter than tergite VIII (Fig. 26).

**Measurements** (♀ in μm). Body length: 1.1 (Type)-1.2 mm.


**Material examined.** Paratype ♀. MEXICO; DISTRITO FEDERAL: Desierto de los leones; 16-VIII-1938; by sweeping herbs (J.R. Watson), in CAS. MORELOS: Sierra de Ahusco, on road Méx-142 (Xochimilco-Oaxtepec), km 48, 2500 m.; 3-V-1985; 1 ♀ in ground litter (Pinus-Quercus-Arbutus Forest); (Roberto M. Johansen), in IBUNAM.

**Comments.** Since the original collection by Watson in 1938, no further specimens were added during the following period of 47 years, until this review. The original description was based in two female adults: Holotype and Paratype. A third adult female was also collected in the Volcanic Range and it was included in this review. As figures (7, 9) show, some variation in the length of the intercellular setae (pair III) is evident. A comparison between the measurements given by Watson (1942) in his original description against the new female, show some variation in the antennal measurements. Watson (Loc. cit.) did not included the postocular setae ii-iii in his illustration of the species. *Frankliniella desertileonidium* Watson, is different from the other species in the assemblage, because it is the smallest species. Because of its very long intercellular setae (pair III), it is close to *Frankliniella oneilleana* (in this character both species differ from the pair *F. brevisetaeoneillae* and *F. zacualtipana*, both bearing the shortest intercellular setae in the assemblage). However, it is different from *F. oneilleana* besides the smaller body size, in the following characters: tergite IX caudal setae IX i-iii are shorter than tergite VIII; the antennal segment III is shorter than VI. Alternatively, *F. oneilleana* is a larger species, with tergite IX caudal setae IX i-iii longer than tergite VIII, and the antennal segment III is longer than VI.
Figures 20-26
Frankliniella oneillae Johansen sp. revalidation
(Figs. 1-2, 10-11, 16, 20-21, 28-29, 33)

Frankliniella oneillae Johansen, 1979: 71 (for 1977 !)
Frankliniella oneillae Johansen; Johansen & Mojica, 1996: 264

Material examined. Holotype ♀, Allotype ♂; paratypes: 6 ♀♀, 2 ♂♂. MEXICO; HIDALGO: Meseta de Zacualtipán (Sierra Madre Oriental), 6 km SW of Zacualtipán, 2600 m.; 30-X-1976; on underside of Senecio roldana leaves, inside of Pinus patula Schl. et Cham. Forest (Roberto M. Johansen), in IBUNAM. Idem et ibidem, 3 km S of Zacualtipán, 2050 m.; 21-X-1979; 8 ♀♀ on underside of Senecio roldana leaves, inside of Pinus patula Schl. et Cham. (Roberto M. Johansen), in IBUNAM.

Comments. Johansen (1979) in his original description of the species, included illustrations of the head, thorax and abdomen from the adults of both sexes; he pointed out the characteristic color of antennal segments III-VI and of fore wings; moreover, the lack of postocular setae i in the head, was illustrated. This is the best known and defined species in the assemblage because of the available adult specimen number of both sexes. Mound and Marullo (1996) synonymized this species under Frankliniella desertileonidum Watson. This is a subjective taxonomic decision, due to an excess of generalization judgement of the case.

Frankliniella oneillae Johansen is herein considered as a valid species, because of the following reasons: 1. The larger size and proportions of females: 1.6 mm in oneillae vs. 1.1-1.2 mm in desertileonidum. 2. The head is not narrowed at base in dorsal outline in oneillae, whereas it is in desertileonidum. 3. The antennal segments III-VI are longer in oneillae. 4. The pronotal surface in oneillae is almost smooth (except in fore margin), and almost completely striate in desertileonidum. 5. The pronotum of oneillae always lacks the median transverse setae row, and the subposterior marginal pair; in desertileonidum, there is a median transverse row of two to three setae, and the median subposterior marginal pair is present. 6. The tergite IX major caudal setae IX i-iii are longer than tergite VIII in oneillae, and much shorter than tergite VIII in desertileonidum. 7. None of these species are sympatric and synchronous. They occur in different regions: oneillae in the Sierra Madre Oriental, whereas desertileonidum is a true Neovolcanic species.

Frankliniella oneileana sp. nov.
(Figs. 3, 12-13, 17, 22, 27, 33)


Female. Body dark chestnut-brown, becoming clearer in abdominal segments I-VII, as well as fore tibiae. Antennal segments: II dark chestnut-brown, yellow in apical one third; III-IV whitish-yellow; V white; VI whitish in basal one half, the rest dark brown. Trochanters and all tarsi yellow. Fore wings dark brown, clear-white in basal one fifth and apical two fifths; hind wings white, with a dark brown median longitudinal vitta. Ocellar crescents red. Body
sae dark brown. Head in dorsal aspect (Fig. 3), broader (1.40 times) than long at middle, but slightly broader at base; cheeks moderately sinuous; occiput sculptured with open and parallel striae, which become confluent at both sides. Antennal segments (Fig. 12), III longer than IV and VI. Mouth-cone shorter than the dorsal length of head. Pronotum (Fig. 3), broader (1.44 times) than long; almost smooth at both sides, but anterior margin with fine transverse and confluent striae, that form a triangle with the vertex towards the posterior margin, which has strong transverse striae; chaetotaxy as follows: major setae, anteroangulars longer than anteromarginals (which are shorter than interocellaris); outer posteroangular shorter than inner; minor setae: 2-3 anteromarginals; 2-3 forming a median transverse row; 1-2 or none subposteromarginals. Pterothorax; mesonotum (Fig. 17), metanotum (Fig. 22); pterosternum (Fig. 13) with short mesofurcal spinula. Tergites VIII-X (Fig. 27); tergite IX with major caudal setae IX i-iii much longer than tergite VIII.

Measurements (Holotype ♂ in μm). Body length: 1.4-1.5 mm.

Head dorsal length: 112. Width at eyes: 144, behind eyes: 146, middle: 156, basal: 158.


Material examined. Holotype ♂, Paratype ♂. MEXICO; VERACRUZ: Sierra Madre Oriental-Volcanic Range, on road Méx-150, km 124, 1990 m.; 21-I-1977; by beating harbaceous inside of Quercus-Pinus Forest (Ernesto Barrera), in IBUNAM.

Comments. Frankliniella oneileana sp. nov., is different from the adults of F. oneileana Johansen, because in the last species the pronotum lacks completely the median transverse setae row and the median subposteromarginal setae pair. From the adults of F. brevisetaeoneileana and F. zacualtipana, because in these species the head is narrower at base, and the interocellar setae (pair III) are short, whereas in F. oneileana the head has a broad base, and the interocellar setae are longer than major pronotal anteroangular and anteromarginal setae. Finally, F. desertileonidum Watson is a much smaller species than F. oneileana with different antennal segment VI color (white in basal one half, whereas in F. desertileonidum is dark brown, with a clear sub-basal ring). The antennal segments III-VI are longer in F. oneileana, as well as the tergite IX major caudal setae IX i-iii which are much longer than tergite VIII; in F. desertileonidum, the antennal segments are shorter, as well as the tergite IX major caudal setae IX i-iii which are shorter than tergite VIII. Etymology this species (as well as F. brevisetaeoneileana) is named honouring the great Northamerican thysanopterist Dr. Kellie O’neill formerly in the U.S. Department of Agriculture.
Figures 27-32
Dorsal views of tergites VIII-X; Figs. 28-29, 31 ventral views of male sternae VI-VII each showing the glandular area.
27. oneileana sp. nov. Holotype ♀. 28. oneilae Johansen Allotype ♂; 29. idem, Paratype ♂; 30. idem, Paratype ♂.
31. brevisetaeoneillae sp. nov. Paratype ♂; 32. idem. Scale in μm, same (400 X) for all figures.
**Frankliniella zacualtipana** sp. nov.  
(Fig. 6, 33)

**Female.** Body color dark chestnut-brown, with abundant orange subhypodermal pigment, except: antennal segments, II dark brown, yellow in apical end; III yellow; IV yellow, light brown in apical one third; V yellow, light brown in apical one half; VI yellow in basal one sixth, the rest dark brown. Fore tibiae yellowish-brown, darker in both sides and basal third; all trochanters and tarsi yellow. Fore wings dark brown clear-white in basal one fifth and apical one third; hind wings white, with a dark brown median longitudinal vitta. Ocellar pigment orange. Body setae brown. Head in dorsal aspect (Fig. 6), broader (1.58 times) than long at middle, narrower towards base. Chaetotaxy as follows: antecellulars (pairs I-II) shorter than ocelli; interocellar (pair III) very reduced (1.0-1.3 times of an ocellar diameter), subequal to postocular IV, but shorter than pronotal posteromarginal ii. Antennal segments (like in Fig. 8): longer than IV-VI. Mouth-cone almost reaching posterior margin of prosternum, and much longer than the dorsal length of head. Pronotum (Fig. 6), broader (1.37 times) than long; its surface almost smooth, but sculptured with transverse and confluent striae in anterior and posterior margins; chaetotaxy as follows: anteroangulars slightly longer than anteromarginals; outer posteroangular shorter than inner; minor setae: two anteromarginals; four forming a curved transverse row; 1-2 median subposteromarginals. Pterothorax; mesonotum (like in Fig. 17); metanotum (like in Fig. 23); pterosternum (like in Fig. 13). Tergites VIII-X (like in Fig. 24); tergite IX with major caudal setae IX i-iii longer than tergite VIII.

**Measurements** (Holotype ♀ in µm). Body length: 1.5 mm.


**Material examined.** Holotype ♀. MEXICO; HIDALGO: Sierra de Zacualtipán (Sierra Madre Oriental), ixtlahuaco, 1480 m.; 11-V-1980; by beating herbaceous (including compositae and umbelliferous) in orchard (Roberto M. Johansen), in IBUNAM.

**Comments.** See comments in Frankliniella brevisetaeoneillae. F. zacualtipana sp. nov., is the only species in the assemblage with very short antecellular setae (pairs I-II), which are shorter than ocelli, but also the very reduced interocellar setae (pair III) is distinctive. Etymology: from Nahuatl language, Tzacualtipan, tzacualli = cloister; pan = in, upon "upon the cloister"; from latin, ana = femeneine.
**Geographic distribution.** The *Frankliniella desertileonidum* species assemblage, has a recent distribution in Mexico, in two main regions (Fig. 33) as follows: a) Sierra Madre Oriental (1500-2600 m.) four species: *F. brevisetaeoneillae* sp. nov., *F. oneillae* Johansen, *F. oneillana* sp. nov. and *F. zacualtipeana* sp. nov. b) Volcanic Range (2500 m.) one species: *F. desertileonidum* Watson.

**Some ecologic data.** Up to the present time, only adults of the species in the *Frankliniella desertileonidum* Watson assemblage are known. They live in *Quercus-Arbutus-Pinus* Forest litter, in herbaceous or, in the underside of *Senecio roldana* leaves, where they make many punctures, which become extensive damaged areas.

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