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The identification of the flower thrips, *Frankliniella* Karny (Thysanoptera: Thripidae) intercepted at U.S. ports of entry

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1039: 1–64 **INSECTA MUNDI** 2024

The identification of the flower thrips, *Frankliniella* Karny (Thysanoptera: Thripidae) intercepted at U.S. ports of entry

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Abstract. U.S. port of entry interception data revealed that *Frankliniella* Karny (Thysanoptera: Thripidae) was the most frequently intercepted genus of Thripidae. No published identification resource for intercepted *Frankliniella* is available to USDA port of entry entomology identifiers. A morphological review of intercepted species was conducted. A dichotomous key for the identification of intercepted slide mounted adult females was created. Morphological diagnosis, description of each species with their geographic region(s) of origin and frequency of interception is provided.

Key words. Taxonomy, key, regulatory, cryptic species.

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Introduction

Port of entry interception data provide insight into which taxa of Thripidae are transported by global trade. Also, the frequency of interceptions from these data may be valuable toward predicting emerging thrips pests. A query of Thripidae interception data between 1985 to 2021 from the Agricultural Quarantine and Activity System-Pest ID (AQAS-Pest ID) database of the United States Department of Agriculture, Animal Plant Health Inspection Services, Plant Protection and Quarantine (USDA, APHIS, PPQ) revealed the most frequently intercepted genus of Thripidae was *Frankliniella* Karny. The genus consists of over 230 species and is the second most species rich genus of Thripidae (ThripsWiki 2023). Most species are from the Neotropics (Mound and Nakahara 1993) and five species are considered native to the Palearctic (Wang et al. 2019).

Currently no published identification resource for intercepted *Frankliniella* is available to USDA port of entry entomology identifiers. A study was conducted to determine which species of *Frankliniella* were intercepted at US ports of entry with the objective of providing an identification resource for regulatory entomologists and academic researchers.

Materials and Methods

Data. The AQAS-Pest ID database was queried to determine which *Frankliniella* species were intercepted from 1985–2021, interception frequency of each species and their recorded geographic regional origins. Interception frequency was categorized as: *very common*, those species intercepted at least 500 times or more, *common*, 100–499 times, *uncommon*, 11–99 times, and *rare*, 10 times or less. The world regional origins recorded in the AQAS-Pest ID database were Asia, Australia and the Pacific, Europe, North Africa and the Middle East, Sub-Saharan Africa, North America, Central America and the Caribbean and South America. These intercepted Frankliniella species were examined using specimens borrowed from the following institutions: The Natural History Museum United Kingdom, London, United Kingdom (BMNH), California Academy of Sciences, San Francisco, CA, USA (CAS);,Forschungsinstitut und Naturmuseum Senckenberg, Frankfurt am Main, Germany (SMF), and the United States Natural History Museum, Beltsville, MD, USA (USNM).

Morphology. All specimens were examined using a Nikon, eclipse Ni microscope (Nikon Corporation, Tokyo, Japan) with differential interference contrast microscopy at 40×, 100×, 400× and 600× magnification. Images were captured with a Nikon DS-Fi2 camera (Nikon Corporation, Tokyo, Japan), and if needed were adjusted for visual

clarity with Helicon Focus 7.6.1 software (Helicon Soft Ltd., Kharkiv, Ukraine), and Photoshop® Elements 12 (Adobe Systems, San Jose, California). All measurements and scale bars were made with NIS-Elements F 4.60.00 software (Nikon Corporation, Tokyo, Japan). Most species referenced in this study are based on the examination of type specimens. The type specimens of *Frankliniella bruneri* Watson, *Frankliniella brunnea* Priesner, *Frankliniella fallaciosa* Priesner and *Frankliniella simplex* Priesner were not examined. Their morphology is derived from expert identified voucher specimens and descriptions by Mound and Marullo (1996).

Abbreviations and terminology used here:

OC3 The ocellar setae pair three.
PO1 The postocular setae pair one.
PO2 The postocular setae pair two.
PO3 The postocular setae pair three.
PO4 The postocular setae pair four.
AM The anteromarginal major setae of the pronotum.
mAM The minor anteromarginal setae of the pronotum.
B1 The abdominal tergite IX medial pair of setae.

0–0–0, 0–0–2, 0–1–2, 1–1–2, 1–2–2 or many (>5) The number of ventral pigmented eye facets found in the inner–center–outer regions of the compound eye (Skarlinsky and Rugman Jones 2023).

1, 2A, 2B, 3, 4 Labels for the orientation of the ocellar setae pair 3 in relation to the ocelli as described by Skarlinsky and Rugman Jones (2023). **1**) Setae are laterad of the anterior ocellus. **2A**) Setae are on or adjacent to a line connecting the outer margins of the anterior and posterior ocelli. **2B**) Setae are within the triangle and between the anterior and posterior ocelli. **3**) Setae are on a line connecting the anterior margins of the posterior ocelli and/or on the inner tangent connecting the anterior and posterior ocelli. **4**) Setae are between the posterior ocelli.

Results

Genus *Frankliniella*

Diagnosis. The genus *Frankliniella* is distinguished from other genera in the Thripidae by having eight (seven in rare occasions) antennal segments with forked sensory cones on segments three and four. The head with three pairs of ocellar setae. The pronotum with one pair of long anteroangular setae, two pairs of long posteroangular setae and five pairs of shorter setae on the posterior margin (Sakimura and O'Neill 1979). The mesonotum lacks discal setae (Mound and Nakahara 1993). The forewings with some exceptions are fully developed with two continuous evenly spaced longitudinal rows of setae. The lateral margins of abdominal tergites V–VIII and occasionally as far forward as tergite III with ctenidia. The ctenidia of tergite VIII are always present anterolateral of the spiracles (Sakimura and O'Neill 1979). The abdominal sternites III–VII do not have discal setae and the three major pairs of setae on sternite VII arise near or on the posterior margin (Mound and Nakahara 1993).

Key to slide-mounted adult females of intercepted *Frankliniella*

Note. Species names followed by (in part) will conclude in more than one couplet.

1. Abdomen dark **2**
— Abdomen mostly pale, dark tergal discal areas and/or dark anterolateral blotches may be present . . **30**

2(1). Metanotal campaniform sensilla absent **3**
— Metanotal sensilla present (Fig. 1A) **7**

3(2). Head protrudes beyond the anterior margin of the compound eyes (Fig. 1B) . . . . ***F. tenuicornis* (Uzel)**
— Head not prolonged **4**

4(3). Abdominal tergite VIII posteromarginal microtrichial comb complete (Fig. 1C) **5**
— Comb incomplete, microtrichia absent medially (Fig. 1D). . . . . ***F. schultzei* (Trybom)** (in part)

5(4). Head with the OC3 setae (Fig. 1B) length less than 2× the longitudinal diameter of a hind ocellus, PO1 setae absent, forewing clavus with 6 or more anteromarginal setae (Fig. 1E) .. ***F. minuta* Moulton**

— Head with the OC3 setae length more than 2.3 × the longitudinal diameter of a hind ocellus (Fig. 1B), PO1 setae present (Fig. 1B) or absent, forewing clavus with 5 anteromarginal setae **6**

6(5). Forewings shaded with a pale base, abdominal tergite VIII posteromarginal microtrichia 4–7 µm long ..... ***F. hemerocallis* Crawford**

— Forewings pale, tergite VIII posteromarginal microtrichia 10–14 µm long .....***F. intonsa* (Trybom)**

7(2). Abdominal tergite VIII posteromarginal microtrichial comb incomplete, microtrichia absent medially (Fig. 1D) **8**

— Tergite VIII posteromarginal comb complete, microtrichia present medially (Fig. 1C) **10**

8(7). Antennal segment III pedicel simple, sides nearly parallel, longer than wide (Fig. 2A) **9**

— Antennal segment III pedicel mushroom-shaped, sides dilated, wider than long or with equal lengths (Fig. 2B) ..... ***F. tritici* (Fitch)** (in part)

9(8). Macropterous, fore wings shaded with a pale base, fore tibiae distinctly pale, sharply contrasting with dark mid and hind tibiae, antennal segment VI sense cone base as wide as the width of segment VII (Fig. 2C) ..... ***F. insularis* (Franklin)**

— Macropterous or micropterous, fore wings pale, all tibiae pale or indistinctly shaded, antennal segment VI sense cone basal width less than segment VII is wide ..... ***F. fusca* (Hinds)**(in part)

10(7). Abdominal sternite III with a pair of small oval pore plates (Fig. 3A) ..... ***F. australis* Morgan**

— Sternites without pore plates **11**

11(10). Compound eyes with 4–5 enlarged anteromarginal and ventral facets nearly 2× the diameter of the other facets (Fig. 3B) **12**

— Facets similar in diameter, or, if larger facets present, these do not exceed 1.5× the diameter of the smaller facets **13**

12(11). Abdominal tergite I with discal lines of sculpture ..... ***F. fulvipennis* Moulton**

— Tergite I without discal sculpture (Fig. 3C) ..... ***F. longipennis* Moulton**

13(11). Antennal segment III pedicel with sides dilated, wider than long or with equal lengths **14**

— Antennal segment III pedicel simple, sides nearly parallel, longer than wide (Fig. 2) **15**

14(13). Antennal segment III pedicel cup-shaped (Fig. 3D) ..... ***F. brevicaulis* Hood**

— Pedicel mushroom-shaped (Fig. 2B) ..... ***F. brunnea* Priesner**

15(13). Antennal segment III pedicel elongate, 1.5–2× longer than wide (Fig. 3E) ..... ***F. parvula* Hood**

— Pedicel less than 1.5× longer than wide **16**

16(15). Head with the OC3 setae shorter than 2× the longitudinal diameter of a hind ocellus, abdominal tergite IX 1.5–2× longer than tergite X, legs dark ..... ***F. colombiana* Moulton**

— Head with the OC3 setae longer than 2.3× the longitudinal diameter of a hind ocellus (Fig. 1B), tergite IX shorter than X, legs variously shaded **17**

17(16). Abdominal tergite IX B1 setae equal to or shorter than length of tergite X, fore wings shaded, legs dark, fore tibiae paler ..... ***F. simplex* Priesner**

— The B1 setae longer than the length of tergite X, fore wings pale or shaded, legs pale or variously shaded **18**

18(17). All tibiae pale **19**

— Fore tibiae paler than mid and hind tibiae, mid and hind tibiae variously shaded **20**

19(18). Pronotum with 2 mAM setae, antennal segment VI with a dorsal subapical cluster of 4–6 small setae on large bases, these are often arranged in a diamond pattern (Fig. 4A) ..... ***F. citripes* Hood**

— Pronotum with 4 mAM setae, antennal segment VI with a transverse dorsal subapical row of 2–3 small setae on large bases (Fig. 4B) ..... ***F. auripes* Hood**

20(18). Mid and hind tibiae shaded, paler than darker femora **21**
— Mid tibiae pale or dark, hind tibiae dark (tibia/femur junction may be slightly paler) or dark with distinct pale basal areas **22**

21(20). Abdominal tergite VIII posteromarginal comb with at least one microtrichia 20–27 μm long, upper surface of the hind coxae with microtrichia (Fig. 5A) . . . . . ***F. panamensis* Hood**
— Abdominal tergite VIII comb microtrichia 12–17 μm long, upper surface of the hind coxae usually without microtrichia . . . . . ***F. occidentalis* (Pergande)** (in part)

22(20). Mid and hind tibiae evenly dark (hind tibia/femur junction may be slightly paler) **23**
— Mid or hind tibiae with distinct paler basal areas **25**

23(22). Head with the PO1 setae (Fig. 5B) **24**
— Head without the PO1 setae (Fig. 5C), pronotum usually with 2 mAM setae . . . . . ***F. tuberosi* Moulton**

24(23). Abdominal tergite VIII posteromarginal comb microtrichia shorter than 16 μm . . ***F. fallaciosa* Priesner**
— Comb with at least one microtrichia 18–24 μm long . . ***F. ecuatoriana* Skarlinsky and Rugman-Jones**

25(22). Antennal segment VI with a dorsal subapical cluster of 4–6 small setae on large bases, often arranged in a diamond pattern (Fig. 4A) **26**
— Antennal segment VI with a dorsal subapical transverse row of 2–3 small setae on large bases (Fig. 4B) **28**

26(25). Mid tibiae pale (Fig. 6D) . . . . . ***F. varipes* Moulton**
— Mid tibiae dark, paler at the tibiae femora junction or basally pale **27**

27(26). Hind tibiae bicolored with the distal 60% dark and basal 40% pale (Fig. 6E) . . . . . ***F. annulipes* Hood**
— Hind tibiae bicolored with the distal 80% dark and the basal 20% pale (Fig. 6F) . . . . . ***F. regia* Hood**

28(25). Antennal segment II pale (Fig. 6A), abdominal tergite VIII comb microtrichia less than 16 μm long . . . . . ***F. pelucensis* Skarlinsky and Rugman-Jones**
— Antennal segment II dark, tergite VIII comb microtrichia longer **29**

29(28). Pronotum with 4 mAM setae (Fig. 6B), the AM setae usually less than100 μm long . . . . . ***F. xanthaner* Hood**
— Pronotum with 2 mAM setae (Fig. 6C), the AM setae more than 100 μm long . . . . . ***F. cognata* Hood**

30(1). Metanotal campaniform sensilla absent **31**
— Metanotal campaniform sensilla present (Fig. 1A) **32**

31(30). Macropterous or micropterous, the head protrudes beyond anterior margin of compound eyes (Fig. 1B) . . . . . ***F. bondari* Hood**
— Macropterous, the head not produced beyond eyes . . . . . ***F. schultzei* Trybom** (part)

32(30). Compound eyes with 4–5 enlarged anteromarginal and ventral facets, nearly 2× the diameter of the other facets (Fig. 3B) . . . . . ***F. ameliae* Hood**
— Eye facets similar in diameter or, if larger facets present, these do not exceed 1.5× the diameter of the smaller facets **33**

33(32). Abdominal tergite VIII posteromarginal microtrichial comb complete (Fig. 1C) **34**
— Comb incomplete, microtrichia absent medially (Fig. 1D) **42**

34(33). Antennal segment III pedicel with sides dilated, wider than long or with equal lengths (Fig. 7A–C) . **35**
— Antennal segment III pedicel simple, sides nearly parallel, longer than wide (Fig. 2A) **46**

35(34). Antennal segment III pedicel saucer-shaped, the basal and distal angles similar (Fig. 7A) **36**
— Pedicel chalice-shaped (Fig. 7B) or mushroom-shaped (Fig. 7C), basal and distal angles different . . **37**

36(35). Antennal segment III pedicel distinctly wider than base of segment III . . . . . ***F. musaeperda* Hood**
— Pedicel less than or slightly wider than base of III (Fig. 7A) . . . . . ***F. invasor* Sakimura**

37(35). Antennal segment III pedicel chalice-shaped with distinct lateral shelves (Fig. 7B) **38**

— Pedicel chalice-shaped without distinct shelves (Fig. 8A–B) or mushroom-shaped (Fig. 7C) **40**

38(37). Antennal segment III basal collar with sides divergent apically, lateral outline distinct (Fig. 7B), upper surface of the hind coxae without microtrichia ..... ***F. borinquen* Hood**

— Basal collar lateral outline indistinct, upper surface of the hind coxae with microtrichia **39**

39(38). Antennal segment II with a pair of stout dorsal apical setae that are decidedly thicker than the dorsal apical setae on segments III–V (Fig. 8C) ..... ***F. funderburki* Skarlinsky and Rugman–Jones**

— Antennal segment II dorsal apical setae similar to the dorsal apical setae on segments III–V ..... ***F. cubensis* Hood**

40(37). Antennal segment III pedicel chalice-shaped (Fig. 8A–B) **41**

— Antennal segment III pedicel mushroom-shaped (Fig. 7C) .....***F. kelliae* Sakimura**

41(40). Antennal segment II at least 2× longer than wide, sides nearly parallel (Fig. 8A) ***F. gardeniae* Moulton**

— Antennal segment II about 1.7× longer than wide, sides distinctly converging basally (Fig. 8B) ..... ***F. sanabriana* Skarlinsky and Rugman–Jones**

42(33). Antennal segment III pedicel simple, sides nearly parallel, longer than wide (Fig. 2A) ..... ***F. fusca* (Hinds)** (part)

— Antennal segment III pedicel with sides dilated, wider than long or with equal lengths (Fig. 9A–D) ... **43**

43(42). Antennal segment III basal collar cup-shaped, sides divergent apically, lateral outline distinct (Fig. 9A–B), segment II with pair of stout dorsal apical setae that are decidedly thicker than dorsal apical setae on segments III–V (Fig. 8C) **44**

— Antennal segment III basal collar lateral outline indistinct (Fig. 9D), segment II dorsal apical setae similar in thickness to dorsal apical setae on segments III–V **45**

44(43). Antennal segment III pedicel saucer-shaped, basal and distal angles similar (Fig. 9A) ..... ***F. bispinosa* Morgan**

— Pedicel chalice-shaped with distinct lateral shelves, upper half with the sides apically convergent (Fig. 9B) ..... ***F. cephalica* (D.L. Crawford)**

45(43). Antennal segment III pedicel saucer-shaped (Fig. 9C) ..... ***F. breviseta* Moulton**

— Pedicel mushroom-shaped (Fig. 9D) ..... ***F. tritici* (Fitch)** (in part)

46(34). Mouth cone longer than the head is wide (Fig. 10A) ..... ***F. desmodii* Mound and Marullo**
Note. A compressed specimen can result in an inaccurate measurement.

— Mouth cone shorter than the head is wide **47**

47(46). Abdominal tergite VIII posteromarginal comb with at least one microtrichia longer than 18 μm, their length greater than the distance between two microtrichia **48**

— Microtrichia shorter, less than 15 μm, their length about equal to the distance between two microtrichia **51**

48(47). Distance between the posterior tangent of the hind ocelli and the posterior margin of the head 58–65 μm (Fig. 10B), upper surface of the hind coxae with microtrichia (Fig. 5A), abdominal tergite IX with the B1 setae usually more than 100 μm ..... ***F. williamsi* Hood**

— Distance between the posterior tangent of the hind ocelli and the posterior margin of the head 43–50 μm, upper surface of the hind coxae with or without microtrichia, abdominal tergite IX, B1 setae usually less than 100 μm (Fig. 10C) **49**

49(48). Upper surface of the hind coxae without microtrichia ..... ***F. gossypiana* Hood**

— Upper surface of the hind coxae with microtrichia (Fig. 5A) **50**

50(49). Abdominal sternite II with at least one discal setae (Fig. 10D) ..... ***F. suramericana* Skarlinsky and Rugman–Jones**

— Sternite II without discal setae ..... ***F. gemina* Bagnall**

51(47). Antennal segment VIII at least 2.5× longer than wide, upper surface of the hind coxae usually without microtrichia ..... ***F. occidentalis* (Pergande)** (in part)

— Antennal segment VIII about 2× longer than wide, upper surface of the hind coxae with microtrichia . ..... ***F. bruneri* Watson**

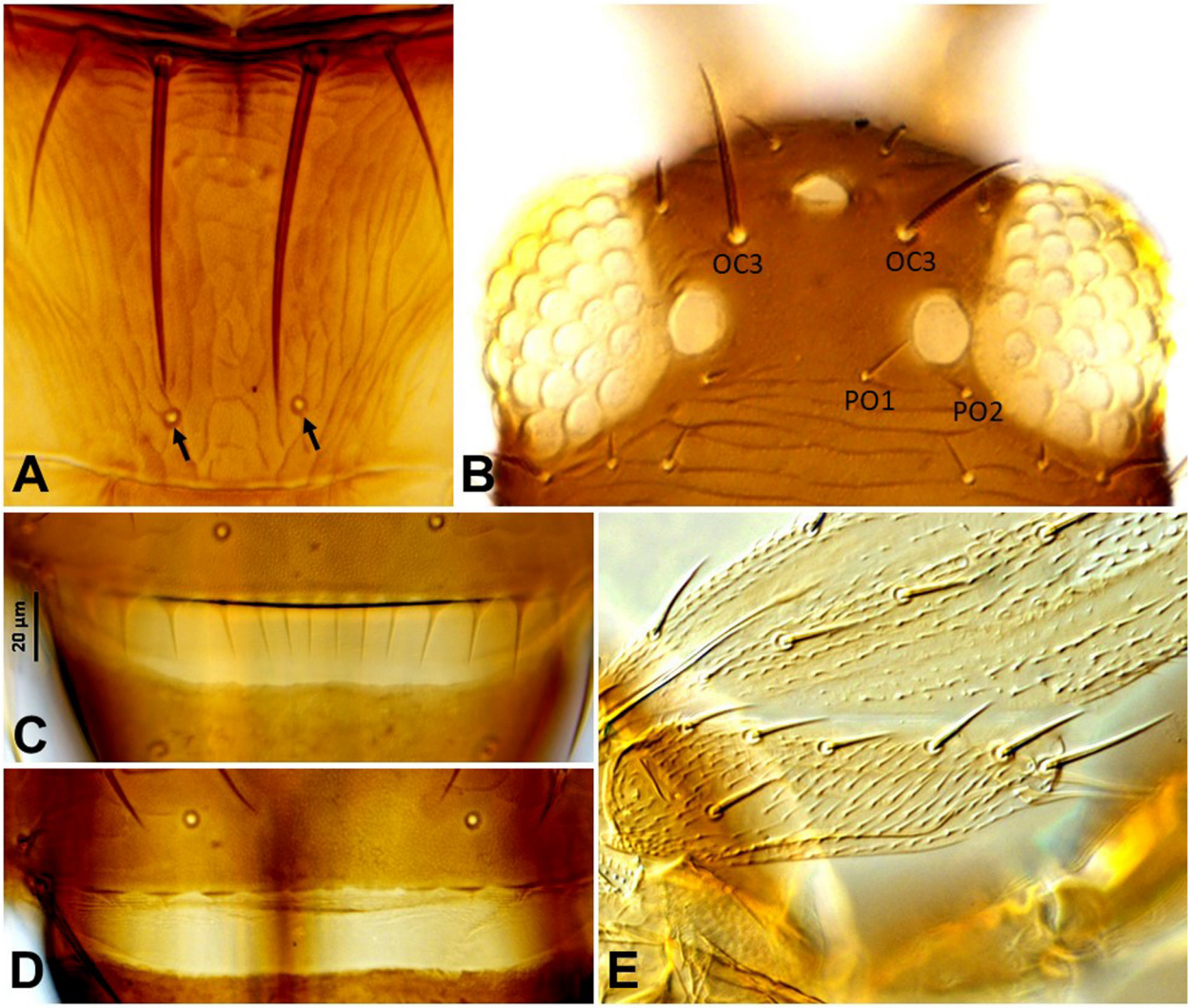

Figure 1. A–E) *Frankliniella* spp. **A)** Metanotum of *F. tuberosi*. Arrows indicate campaniform sensilla. **B)** Head of *F. tenuicornis* with ocellar setae and postocular setae labelled. **C–D)** Abdominal tergite VIII posteromarginal comb. **C)** *F. xanthaner*. **D)** *F. schultzei*. **E)** Forewing clavus of *F. minuta*.

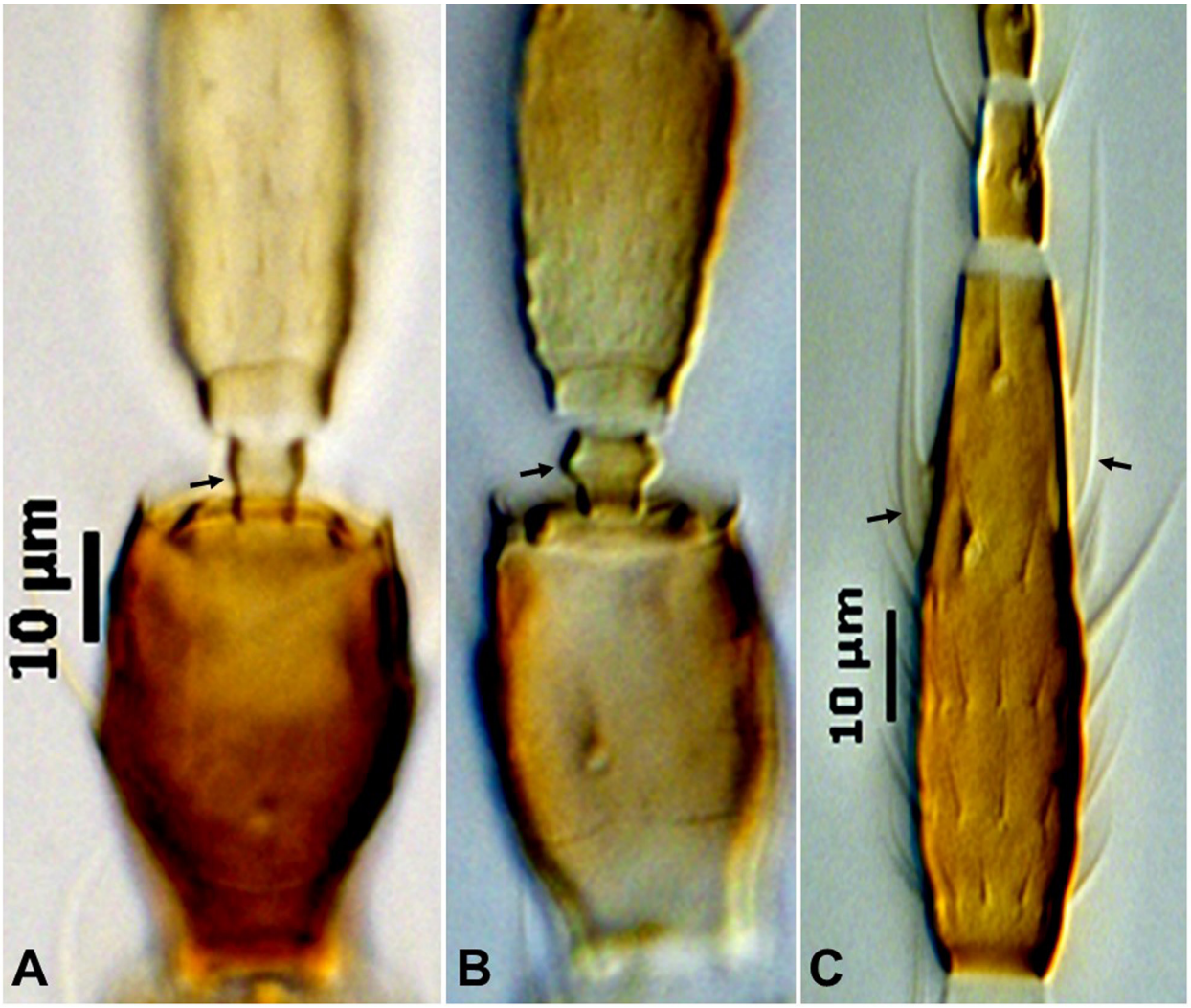

Figure 2. A–C) *Frankliniella* spp. **A–B)** Antennal segments II and III. Arrows indicate pedicel. **A)** *F. tenuicornis*. **B)** *F. tritici*. **C)** Antennal segments VI and VII of *F. insularis*. Arrows indicate bases of sense cones.

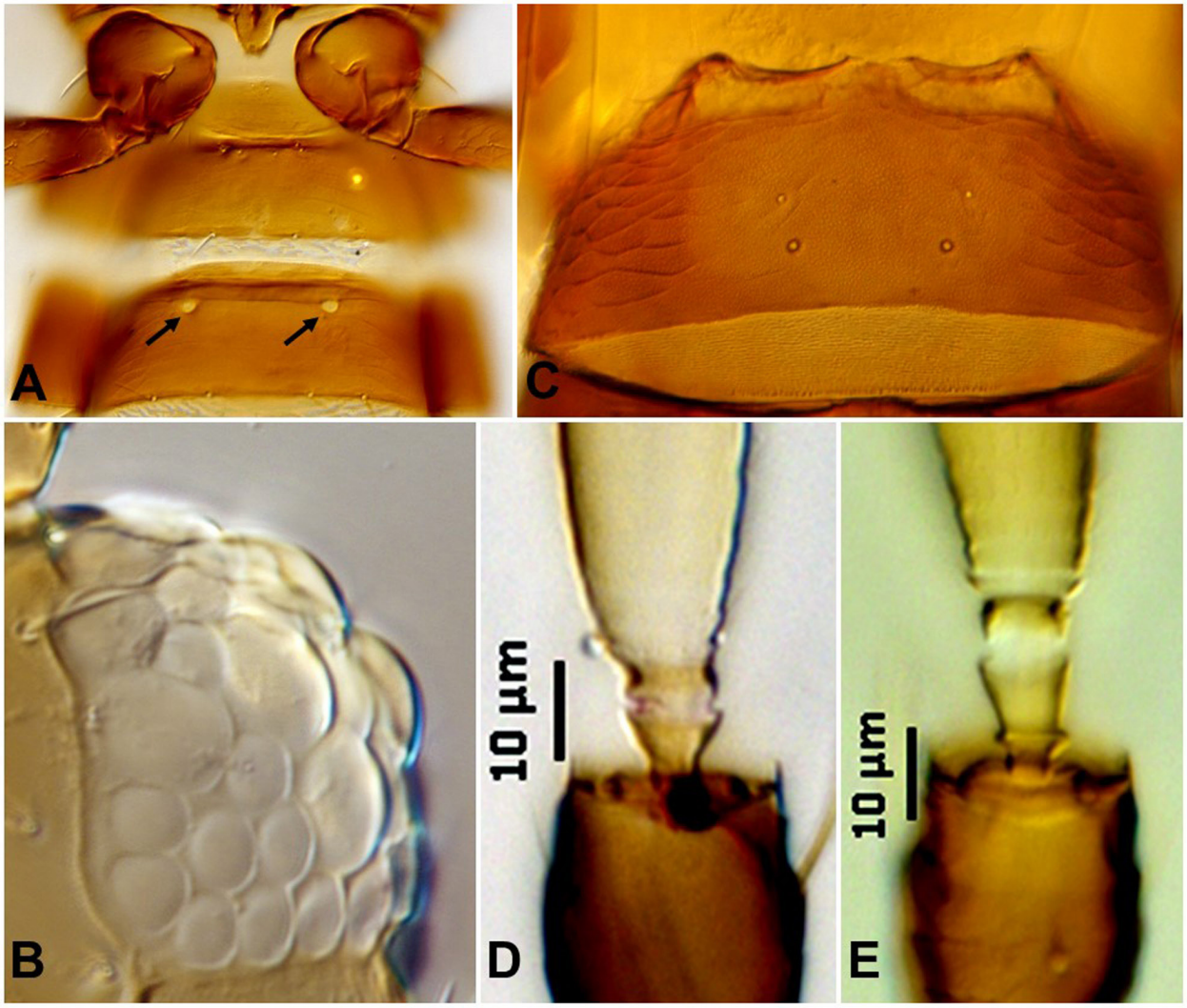

Figure 3. **A–E)** *Frankliniella* spp. **A)** Abdominal sternites I–III of *F. australis*. Arrows indicate pore plates. **B)** Ventral compound eye of *F. fulvipennis* **C)** Abdominal tergite I of *F. longipennis*. **D–E)** Pedicel of antennal segment III. **D)** *F. brevicaulis*. **E)** *F. parvula*.

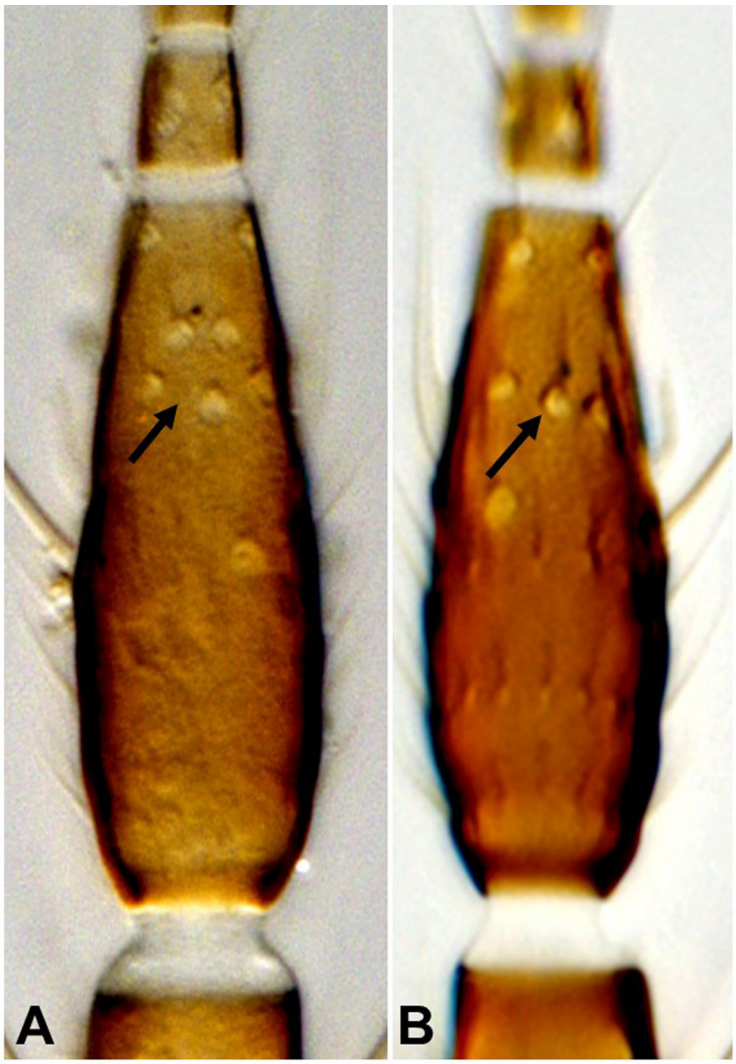

Figure 4. **A–B)** *Frankliniella* spp. **A–B)** Antennal segment VI. Arrows indicate location of the small setae on large bases. **A)** *F. citripes*, holotype, USNM 74422. **B)** *F. auripes*.

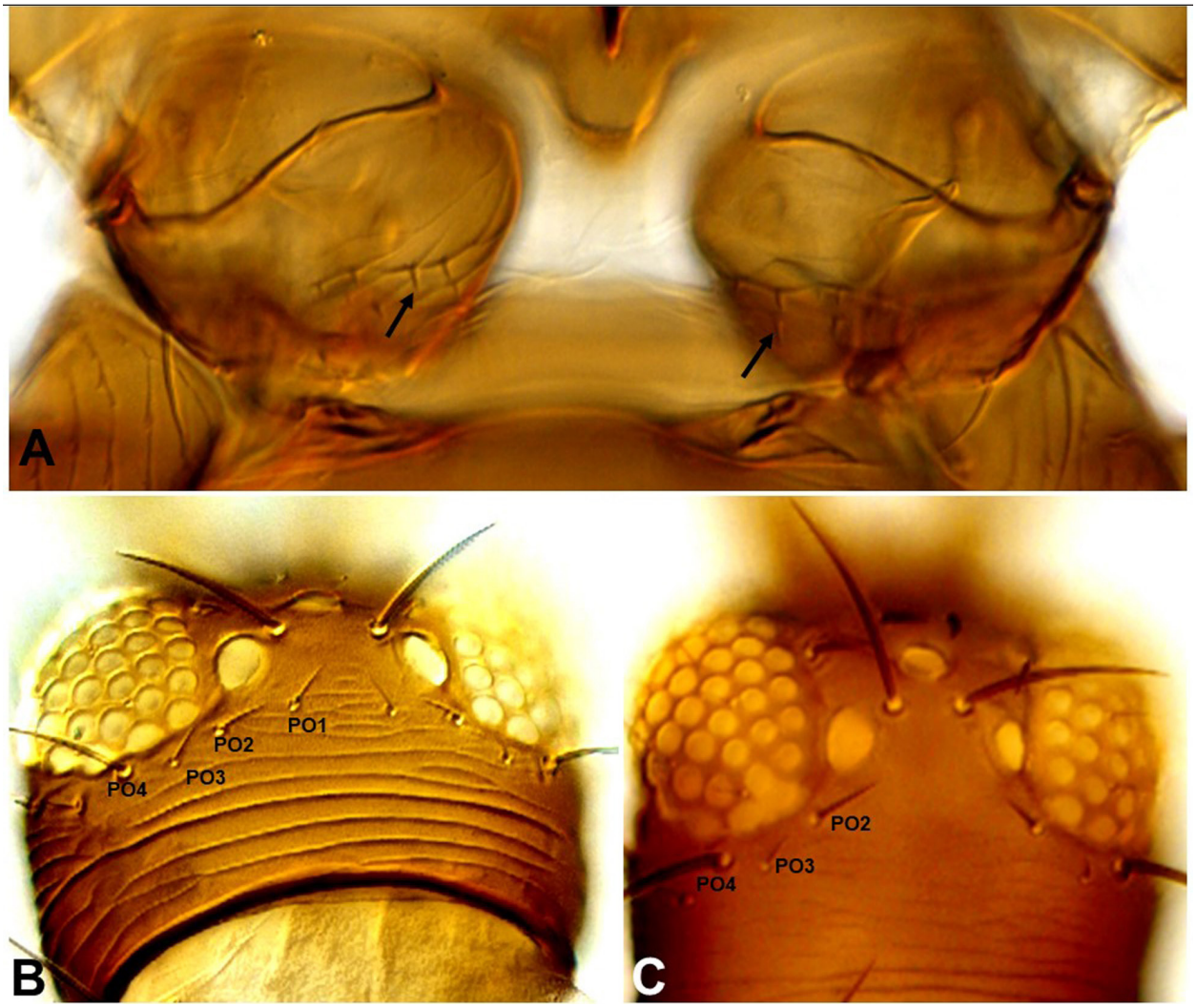

Figure 5. **A–C)** *Frankliniella* spp. **A)** Upper surface of the hind coxae of *F. panamensis*. Arrows indicate microtrichia. **B–C)** Head with postocular setae labelled. **B)** *F. fallaciosa*. **C)** *F. tuberosi*.

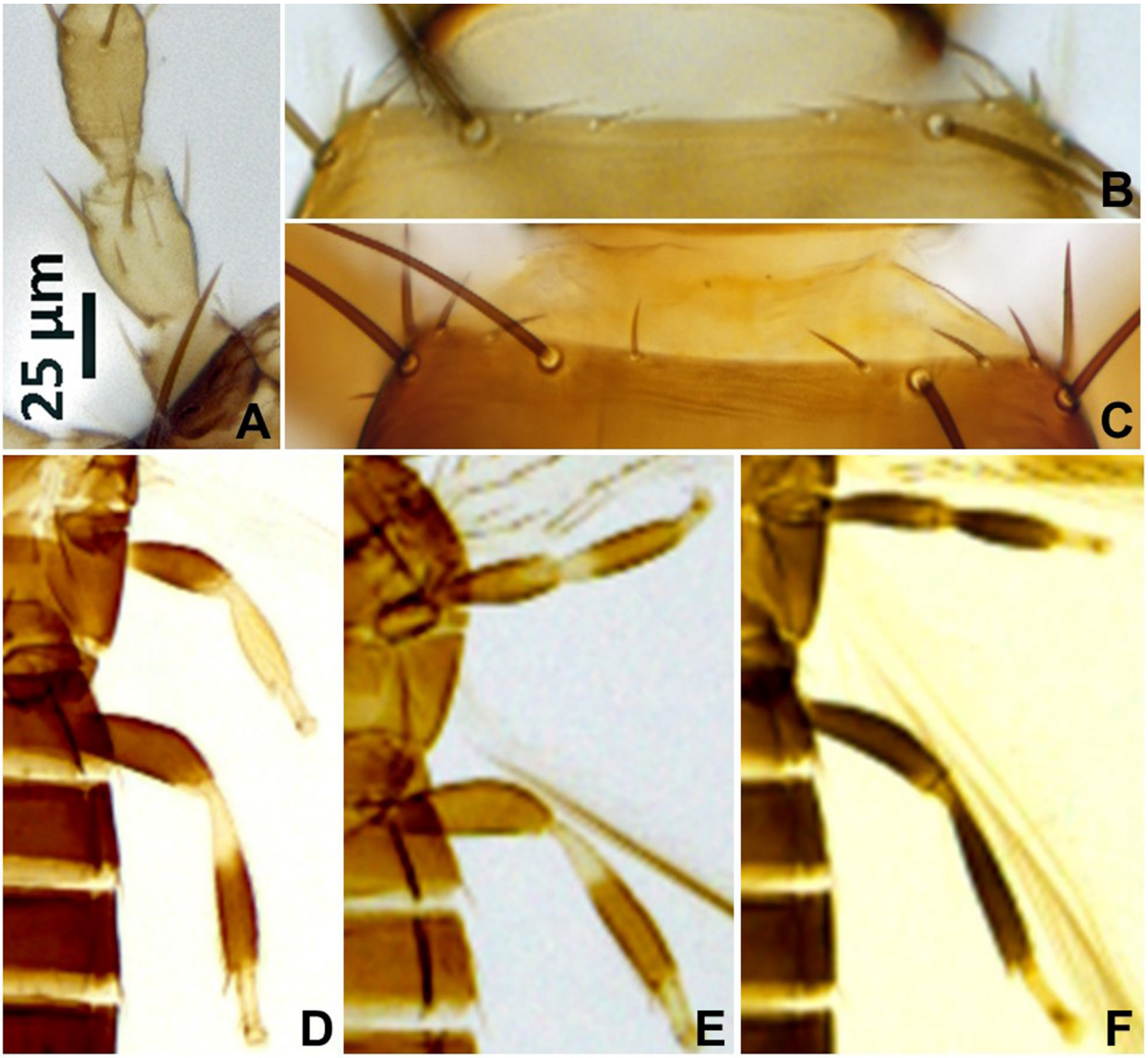

Figure 6. **A–F)** *Frankliniella* spp. **A)** Antennal segments I–III of *F. pelucensis*. **B–C)** Pronotum, anterior margin. **B)** *F. xanthaner*. **C)** *F. cognata*. **D–F)** Mid and hind legs. **D)** *F. varipes*. **E)** *F. annulipes*. **F)** *F. regia*.

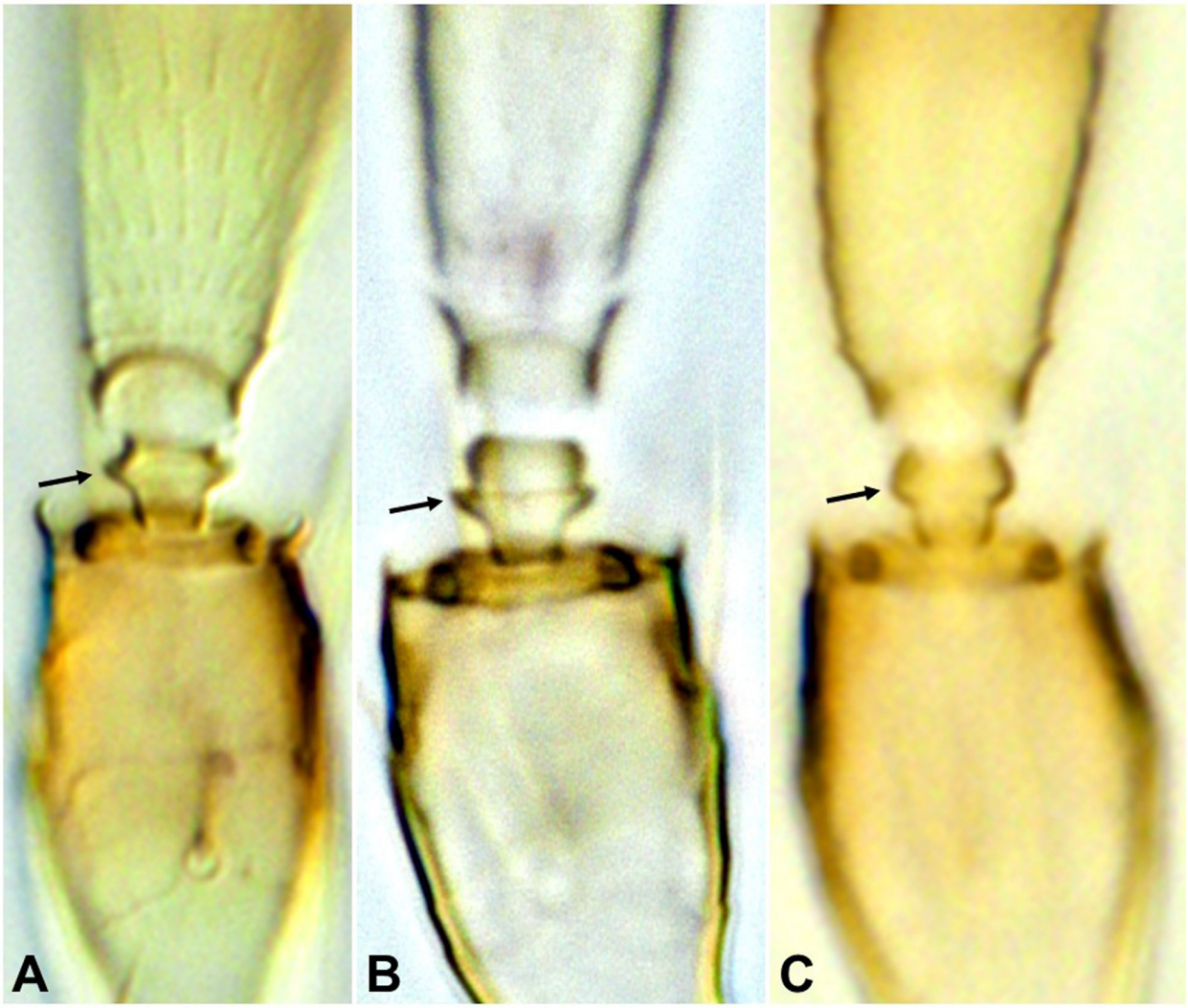

Figure 7. A–C) Pedicel between antennal segments II and III. Arrows indicate the pedicel. *Frankliniella* spp. **A)** *F. invasor*. **B)** *F. borinquen*. **C)** *F. kelliae*.

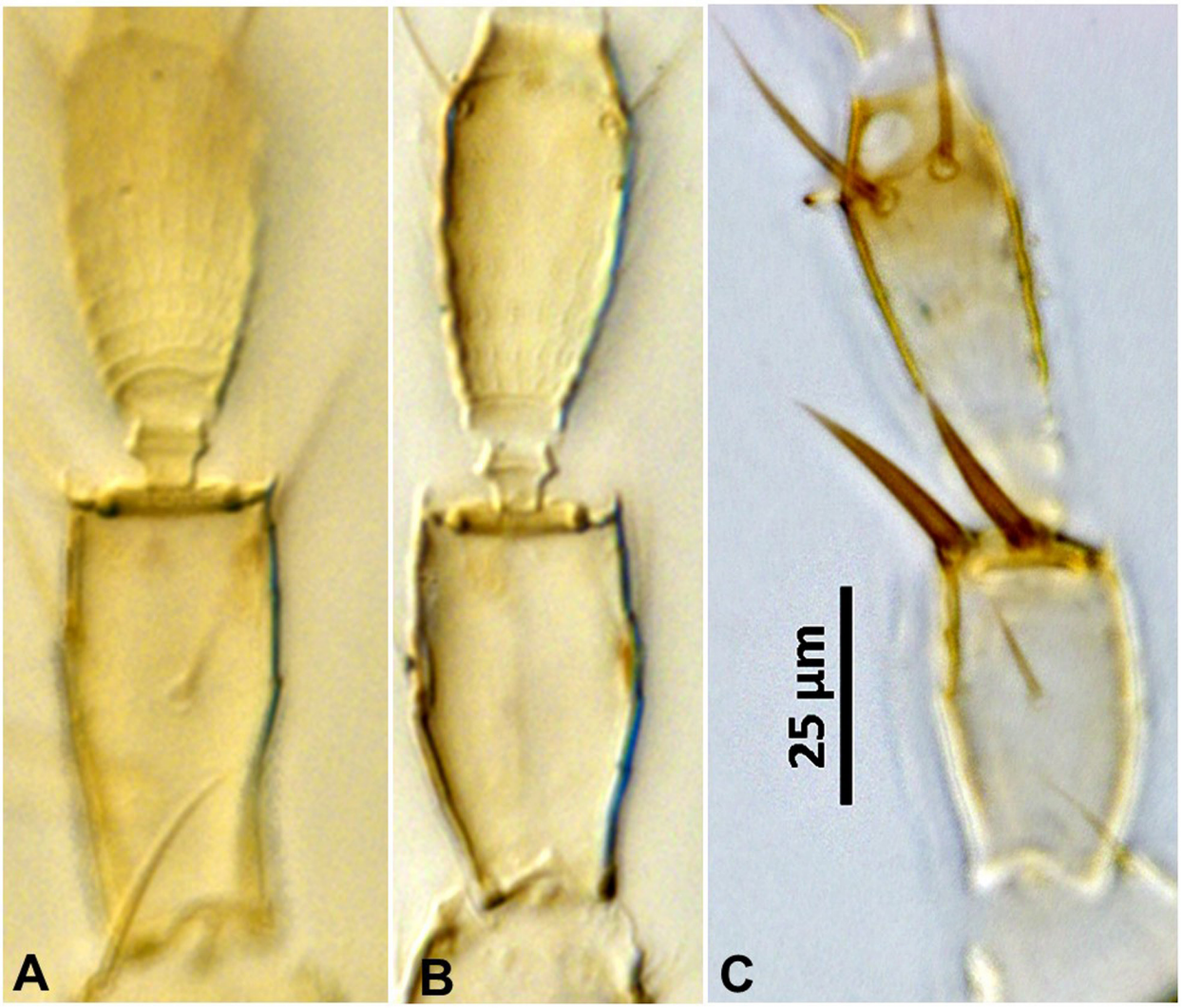

Figure 8. **A –C)** Antennal segments II and III. *Frankliniella* spp. **A)** *F. gardeniae*. **B)** *F. sanabriana*. **C)** *F. funderburki*.

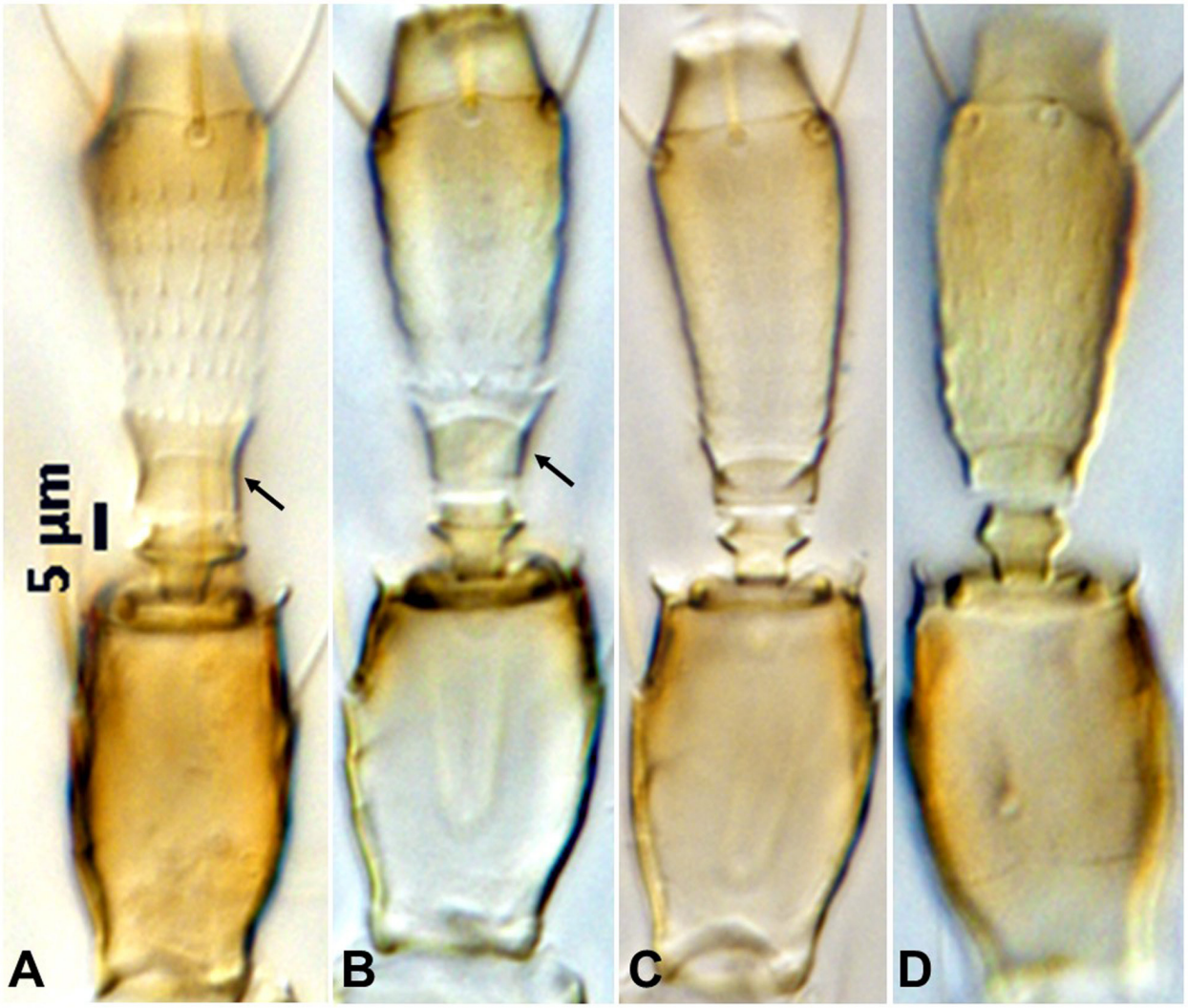

Figure 9. A–D) Antennal segments II and III. Arrows indicate basal collar. *Frankliniella* spp. **A)** *F. bispinosa*. **B)** *F. cephalica*. **C)** *F. breviseta*. **D)** *F. tritici*.

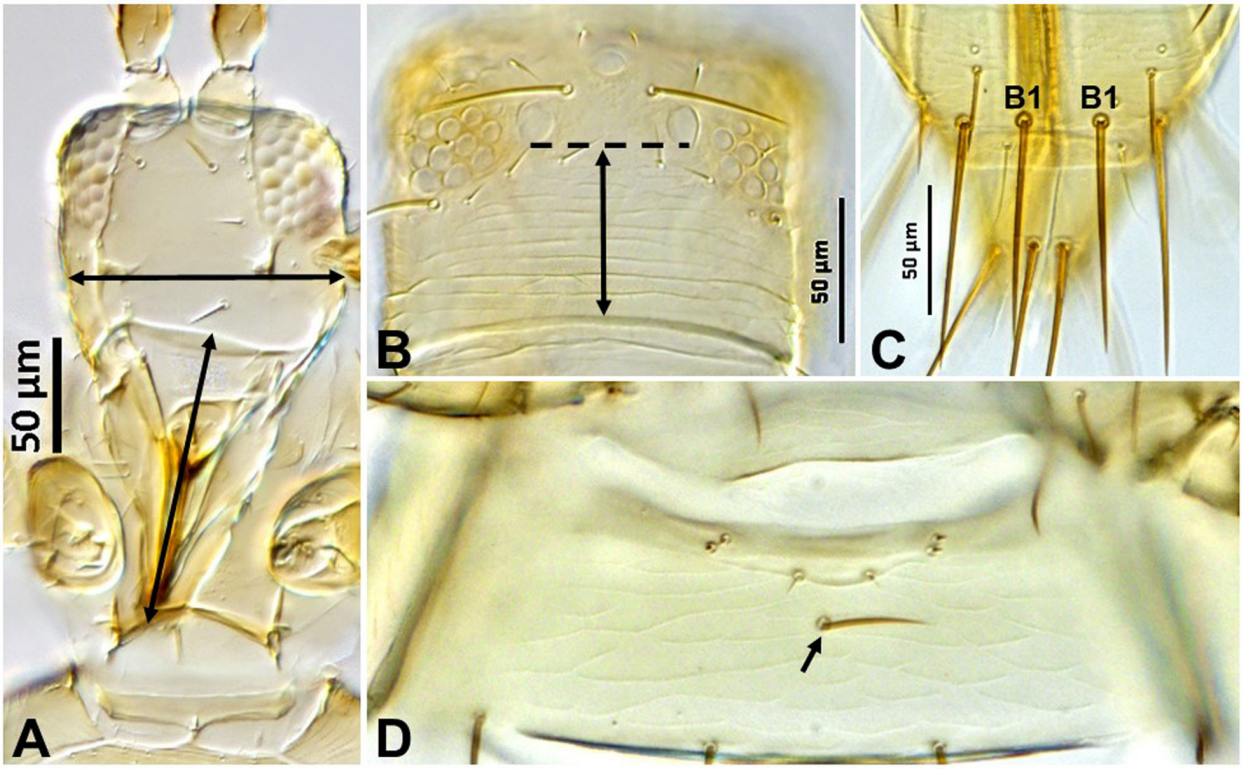

Figure 10. A–D) *Frankliniella* spp. **A)** Ventral head and mouth cone of *F. desmodii*. Arrows indicate points of measure. **B)** Head of *F. williamsi*. Arrow and dashed line indicate points of measure. **C)** Abdominal tergites IX–X of *F. gossypiana* with B1 setae labelled. **D)** Abdominal sternite II of *F. gossypiana*. Arrow indicates discal seta.

Descriptions of intercepted *Frankliniella*

Note. Thrips are highly dispersive in their behavior and, as a result adults land on a wide range of substrates (Mound 2013). Given the dispersive nature of adults and speciose nature of the genus it is possible species not included in this key could be intercepted. Therefore, other morphologically similar species examined during this study are included for comparison. These species are indicated with an asterisk (*). Furthermore, some species are not illustrated, because available specimens were poorly curated, and thus, their images were judged by the author to be of little informative value.

Frankliniella ameliae Hood (Fig. 11)

Diagnosis. *Frankliniella ameliae* belongs to a group of congeners that are distinguished by having a cluster of enlarged ventral compound eye facets. These include *Frankliniella salviae** Moulton, *F. fulvipennis* Moulton, and *Frankliniella lorena** Mound and Marullo.

Distinguishing features. *Color.* Body lightly shaded, abdominal tergites medially darker, forewings shaded, basally slightly paler, femora shaded, tibiae paler (Fig. 11A). *Structure.* Compound eyes with enlarged antero-marginal and ventral compound eye facets (Fig. 11B). Head with PO1 setae, OC3 setae in position 2B (Fig. 11C). Upper surface of the hind coxae with microtrichia. Abdominal tergite VIII posteromarginal comb complete, microtrichia 8–12 µm long.

Interception frequency. Rare.

Region(s) of interceptions. South America.

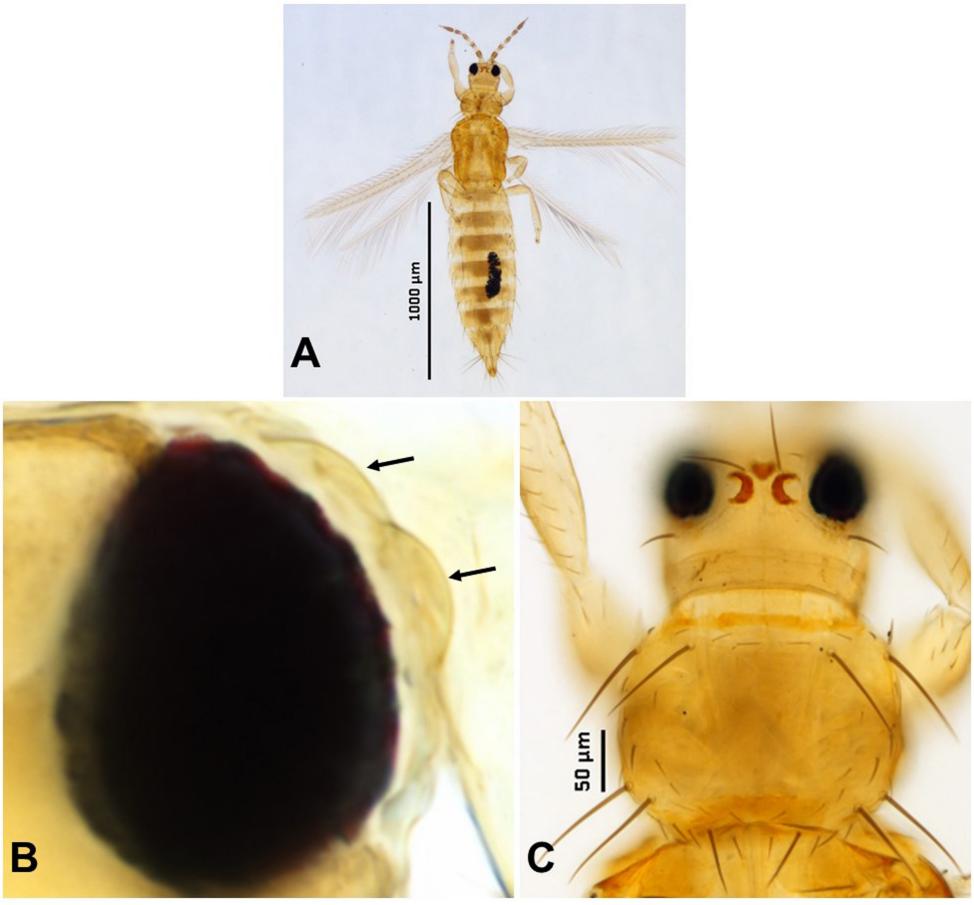

Figure 11. A–C) *Frankliniella ameliae*, holotype, USNM 74431. **A)** Body. **B)** Ventral compound eye. Arrows indicate enlarged marginal facets. **C)** Head and pronotum.

Frankliniella annulipes Hood (Fig. 12)

Diagnosis. The combination of the pale fore tibiae with the bicolored mid and hind tibiae of this species is similar to the South American congeners, *Frankliniella rex** Hood and *Frankliniella regalis** Hood. Another similar species, *Frankliniella varipes* Moulton described from Brazil also has bicolored hind tibiae, but the mid tibiae are pale. All possess a diamond shape cluster of 4–6 setae on the subapical dorsum of antennal segment VI.

Distinguishing features. *Color.* Body dark, forewings dark, basally paler, femora dark, foretibiae pale, mid and hind tibiae dark, basally pale (Fig. 12A). Pigmented ventral eye facets with the 0–1–2 pattern. *Structure.* Antennal segment VI with 4–6, minute dorsal setae, these often arranged in a diamond pattern (Fig. 12B). Head with the PO1 setae, OC3 setae in position 2B (Fig. 12C). Pronotum with 2 mAM setae (Fig. 12C). Upper surface of the hind coxae with microtrichia. Abdominal tergite VIII posteromarginal comb complete.

Interception frequency. Rare.

Region(s) of interceptions. Central America and the Caribbean.

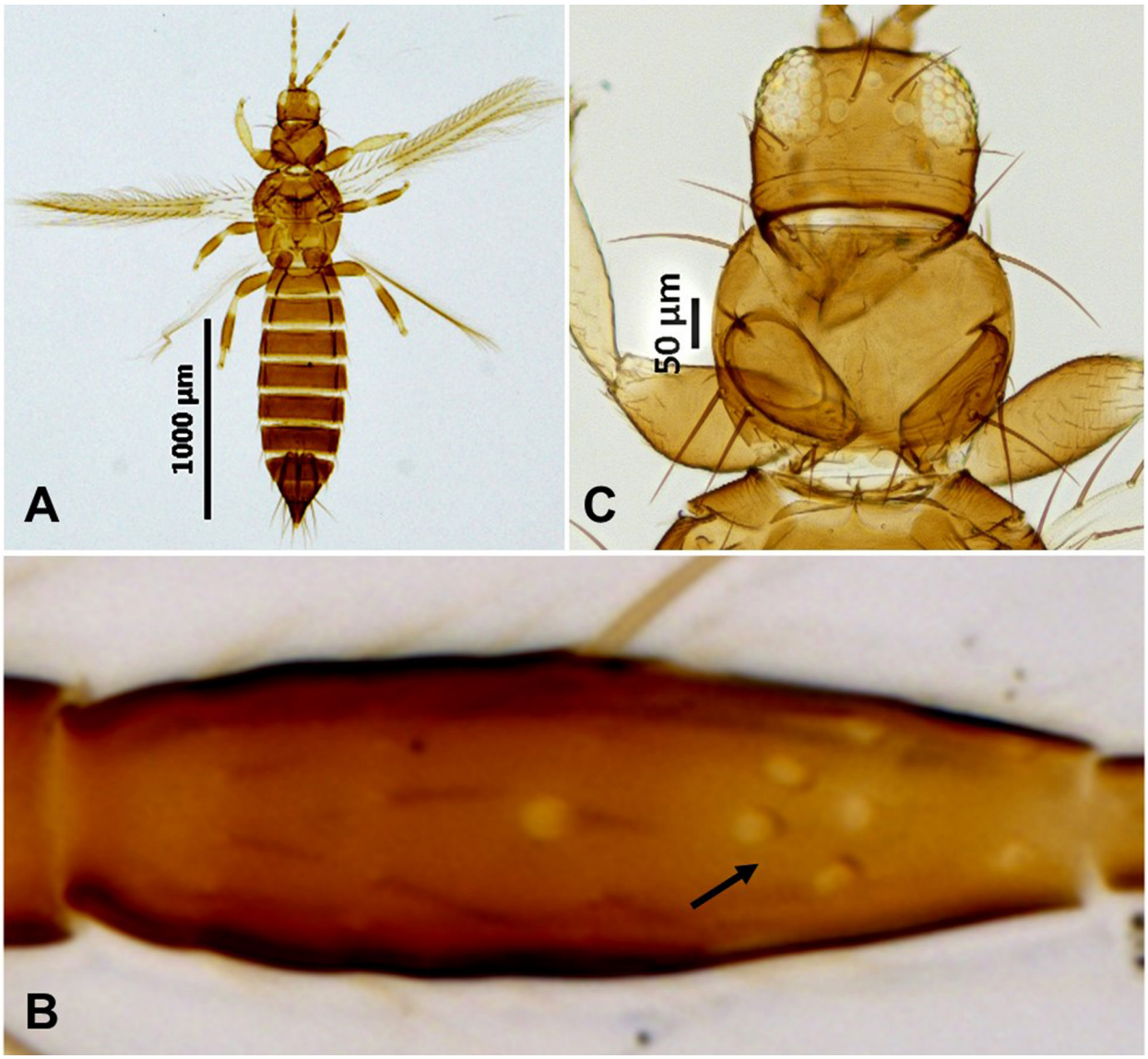

Figure 12. A–C) *Frankliniella annulipes*. **A)** Body. **B)** Antennal segment VI. Arrow indicates diamond pattern of setae bases. **C)** Head and pronotum.

Frankliniella auripes Hood (Fig. 13)

Diagnosis. The combination of a dark body and all pale tibiae separates *F. auripes* from most other dark species. Others with this coloration include *Frankliniella citripes* Hood, *Frankliniella fulvipes** Bagnall, *Frankliniella incerta** Berzosa, and *Frankliniella sanramona** Mound and Marullo. The longer (approximately 20 µm) abdominal tergite VIII posteromarginal comb microtrichia on *F. auripes* distinguishes it from *F. citripes*, *F. fulvipes**, and *F. sanramona**, which have shorter (less than 15 µm) comb microtrichia. In contrast *F. auripes* and *F. incerta** are morphologically inseparable.

Distinguishing features. *Color.* Body dark, forewings dark, basally pale, legs with all tibiae and tarsi pale (Fig. 13A). Pigmented ventral eye facets usually with the 1-2-2 pattern (Fig. 13B). *Structure.* Head with the PO1 setae, OC3 setae in position 2B. Pronotum with 4 mAM setae (Fig. 13C). Upper surface of the hind coxae with microtrichia. Abdominal tergite VIII posteromarginal comb complete, microtrichia approximately 20 µm (Fig. 13D).

Interception frequency. Very common.

Region(s) of interceptions. South America.

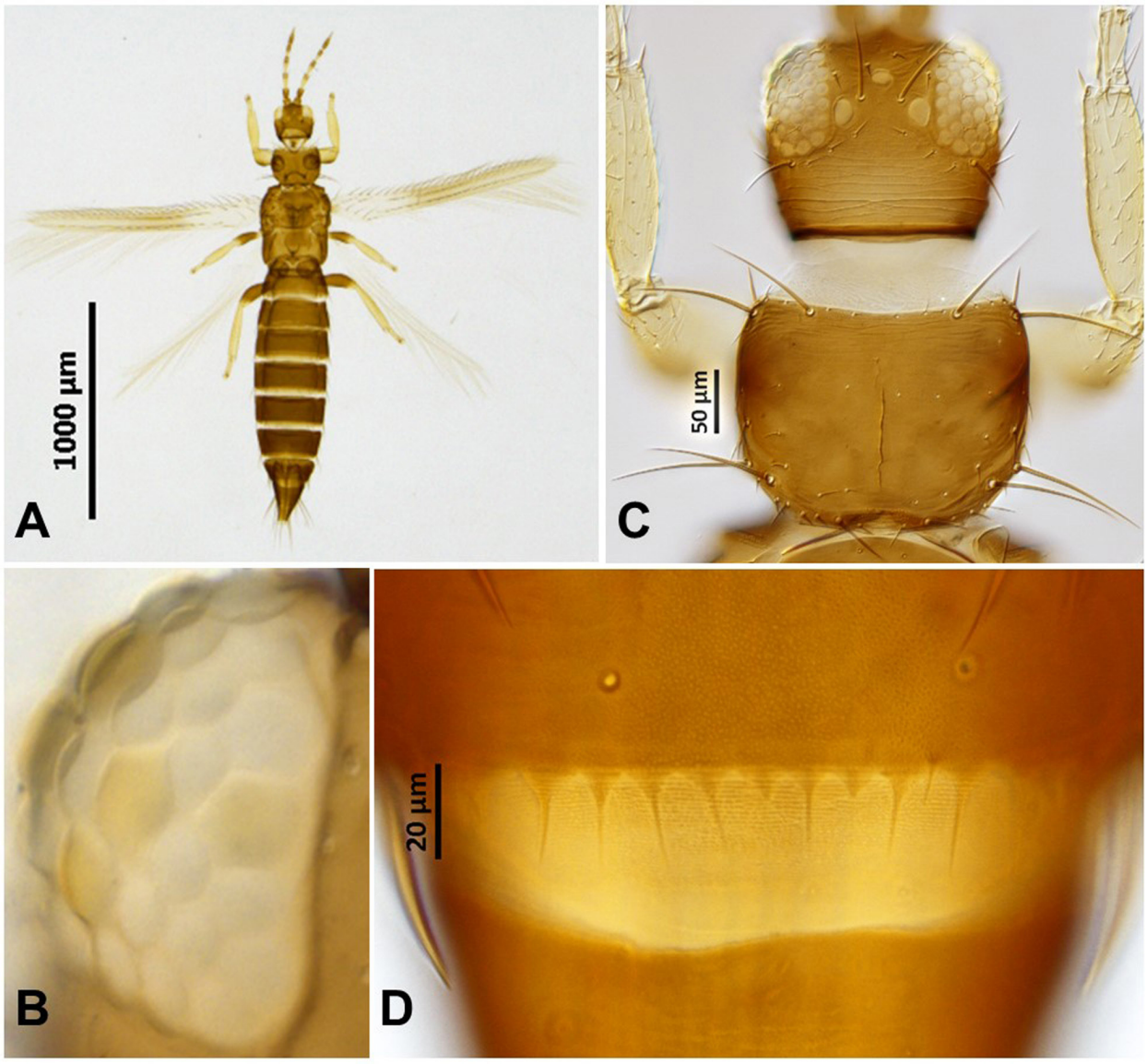

Figure 13. A–D) *Frankliniella auripes*. **A)** Body. **B)** Ventral eye with 1-2-2 pigmented facet pattern. **C)** Head and pronotum. **D)** Abdominal tergite VIII posteromarginal comb.

Frankliniella australis Morgan (Fig. 14)

Diagnosis. Unique amongst the intercepted species, females of *F. australis* have a pair of small oval pore plates on abdominal sternite III (Fig. 14A). Also, Lima and Miyasato (2017) reported the antennal segment VIII is long relative to antennal segment VII (Fig. 14B).

Distinguishing features. *Color.* Body dark, forewings dark, basally pale, legs dark with fore tibiae paler, mid and hind tibiae paler at femora-tibia junction (Fig. 14C). Eyes with many ventral pigmented facets. *Structure.* Head with the PO1 setae, OC3 setae in position 2B (Fig. 14D). Pronotum with 3–7 mAM setae (Fig. 14D). Upper surface of the hind coxae with microtrichia. Abdominal sternite III usually with a pair of oval pore plates, sometimes pore plates may be present on other sternites. Abdominal tergite VIII posteromarginal comb complete.

Interception frequency. Very common.

Region(s) of interceptions. South America.

Comments. In addition to *F. australis,* Lima and Miyasato (2017) reported seven more congeners with females that possess sternal pore plates.

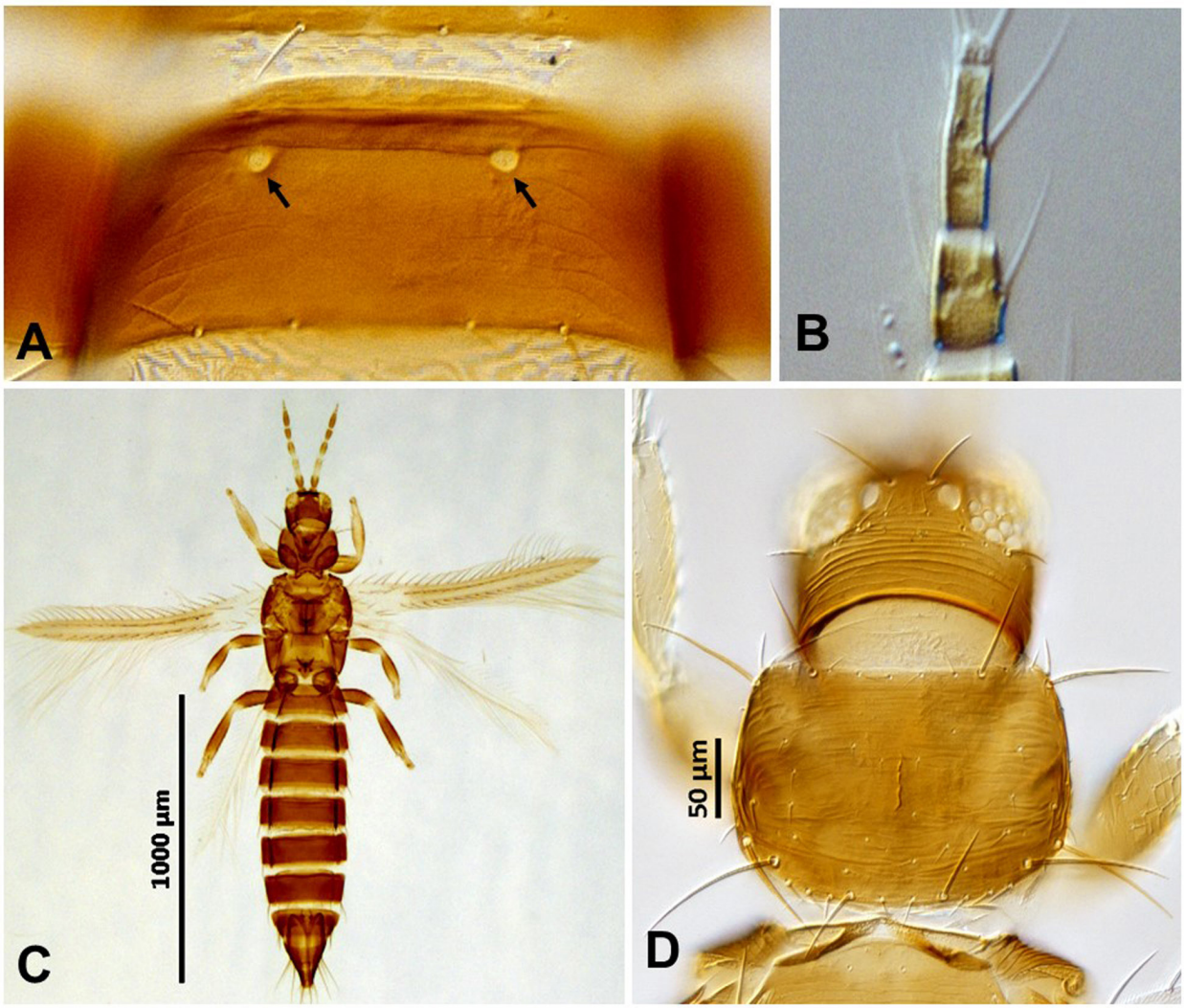

Figure 14. A–D) *Frankliniella australis*. **A)** Abdominal sternite III. Arrows indicate the pore plates. **B)** Antennal segments VII and VIII. **C)** Body. **D)** Head and pronotum.

Frankliniella bagnalliana Hood (Fig. 15)

Diagnosis. This species was added by Retana-Salazar and Mound (1995) to the minuta group series proposed by Sakimura and O'Neill (1979). Members of this group have short OC3 setae and rather compact antennal segments (Fig. 15A). A combination of characters and states distinguishes *F. bagnalliana* from other members of the group. These include, the B1 setae being shorter than the length of abdominal tergite IX, the head usually with the PO1 setae, and with the AM setae less than 30 µm.

Distinguishing features. *Color.* Body dark, forewings dark, basally pale, legs dark with femora and tibiae indistinctly shaded from dark to pale. *Structure.* Head with the PO1 setae, OC3 setae short and in position 2B (Fig. 15B). Pronotum with 2 mAM setae (Fig. 15C). Abdominal tergite VIII posteromarginal comb complete. Abdominal tergite IX B1 setae equal to or shorter than tergite X is long (Fig. 15D).

Interception frequency. Rare.

Region(s) of interceptions. North America.

Comments. The mid and hind tibiae can be shaded from pale to dark within the same or between different populations (Mound and Marullo 1996).

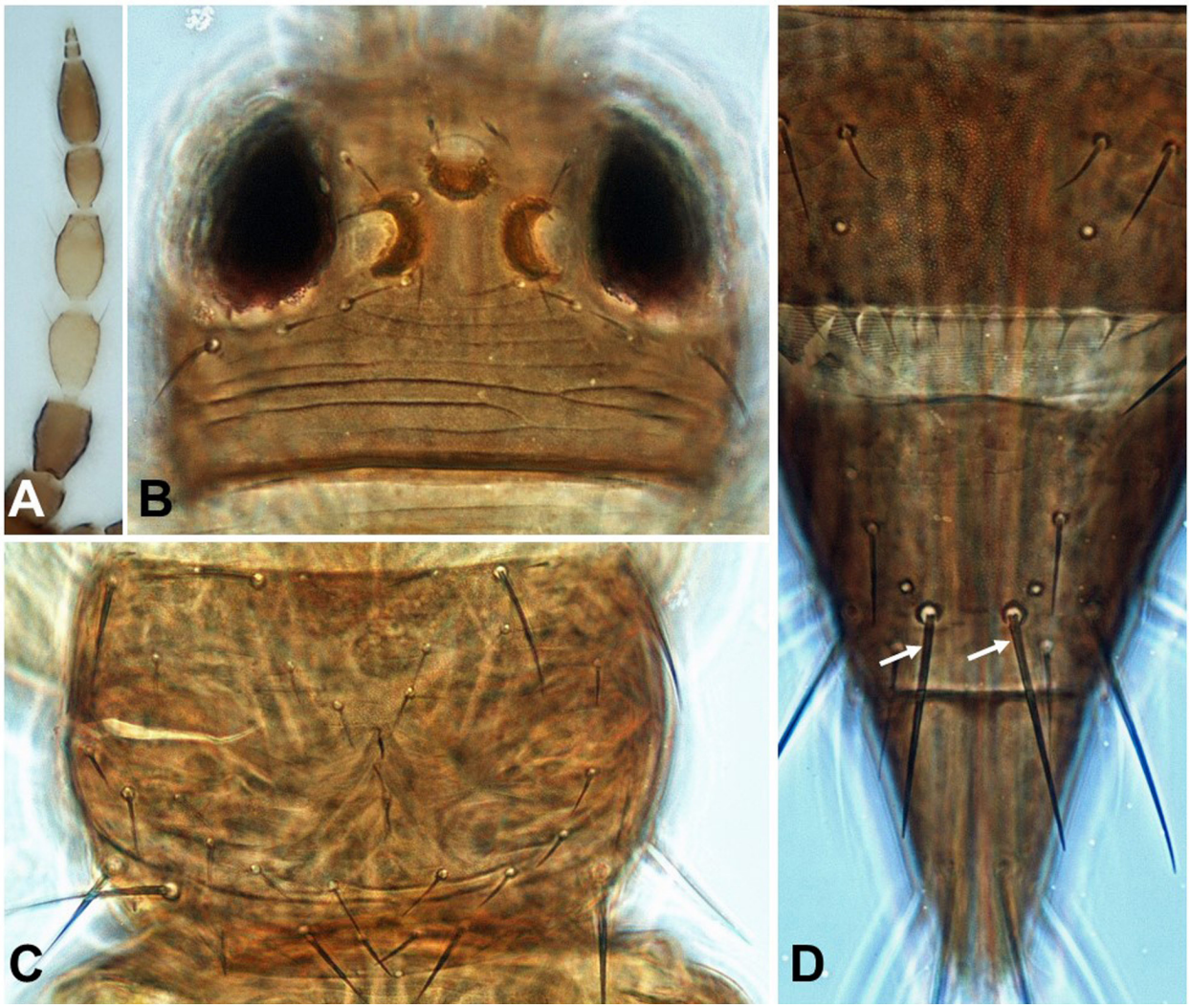

Figure 15. A–D) *Frankliniella bagnalliana*, holotype, USNM 74402. **A)** Antenna. **B)** Head. **C)** Pronotum. **D)** Abdominal tergites VIII–X. The arrows indicate the B1 setae on tergite XI.

Frankliniella bispinosa (Morgan) (Fig. 16)

Diagnosis. This pale species is characterized by the dorsal apical spine–like setae on antennal segment II, the distinctive shape of the antennal segment III basal collar and saucer-shaped pedicel.

Distinguishing features. *Color.* Body, forewings, legs pale (Fig. 16A). Pigmented ventral eye facets with the 0-1-2 pattern (Fig. 16B). *Structure.* Antennal segment II with dorsal apical spine–like setae (Fig. 16C), segment III pedicel saucer-shaped, basal collar distinct, distally expanded and often sides medially constricted (Fig. 16D). Head with the PO1 setae, OC3 setae in position 2B (Fig. 16E). Pronotum usually with 2 mAM setae (Fig. 16E). Upper surface of the hind coxae without microtrichia. Abdominal tergite VIII posteromarginal comb incomplete.

Interception frequency. Rare.

Region(s) of interceptions. Central America and the Caribbean.

Frankliniella bondari Hood

Diagnosis. Macropterous or micropterous forms of *F. bondari* can be found. This species belongs to a cohort of *Frankliniella* in which the head protrudes beyond the anterior margin of the eyes.

Distinguishing features. *Color.* Body, forewings, legs pale. *Structure*. The head protrudes beyond the anterior margin of the compound eyes. Head without the PO1 setae, OC3 setae in position 2B. Pronotum with 2 mAM setae. Metanotum without campaniform sensilla. Abdominal tergite VIII comb incomplete.

Interception frequency. Rare.

Region(s) of interceptions. North America, Central America and the Caribbean.

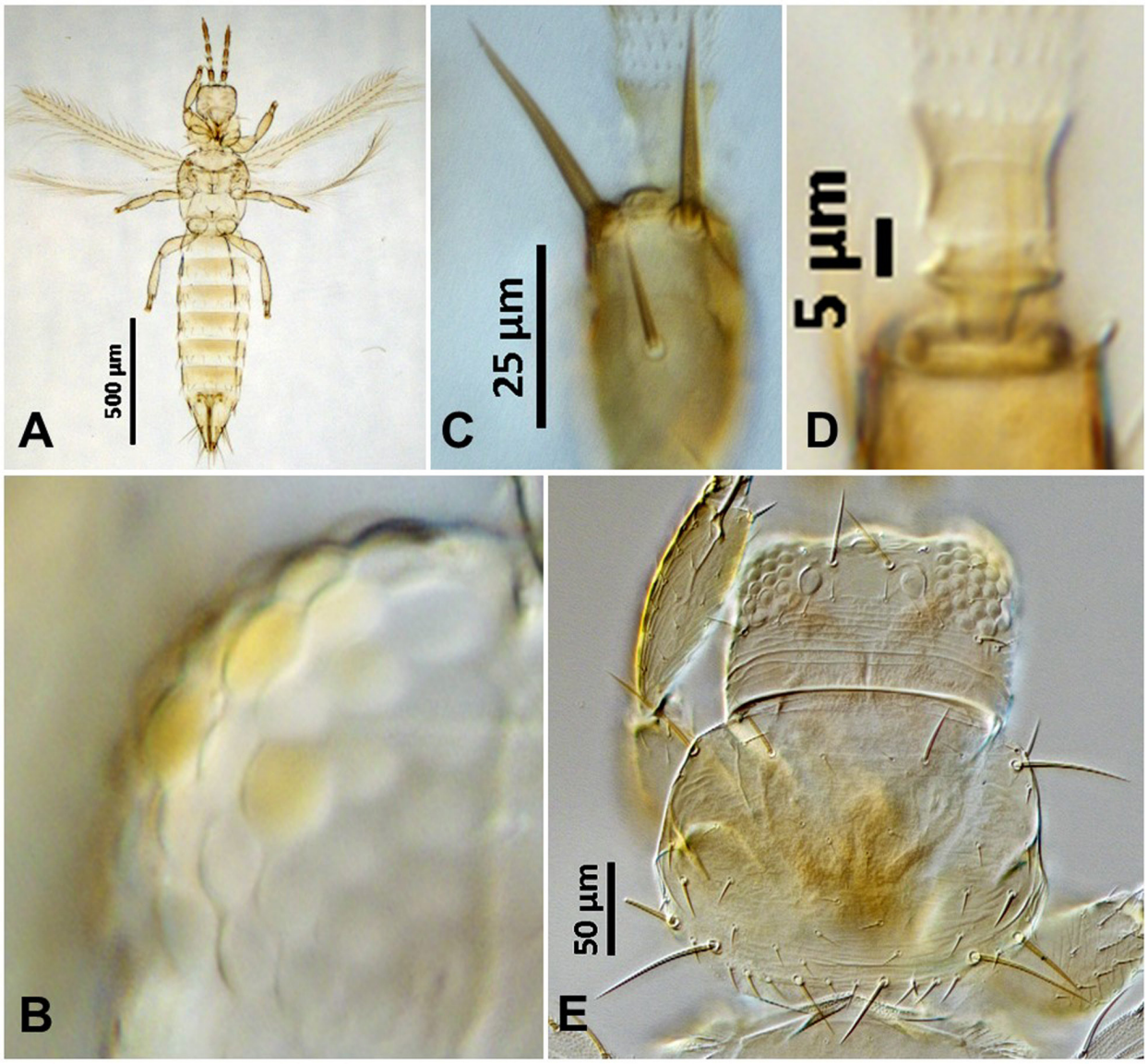

Figure 16. A–E) *Frankliniella bispinosa*. **A)** Body. **B)** Ventral compound eye. **C)** Antennal segment II dorsal apical pair of setae. **D)** Antennal segment III pedicel and basal collar. **E)** Head and pronotum.

Frankliniella borinquen Hood (Fig. 17)

Diagnosis. This species is similar to *Frankliniella melanommata** Williams. The abdominal tergite VIII microtrichial comb of *F. borinquen* is complete whereas the comb of *F. melanommata** is incomplete. Both species possess a distinct, distally expanded basal collar on the antennal segment III. The distal portion of the pedicel is parallel sided or slightly expanded on *F. borinquen* and distinctly swollen on *F. melanommata**.

Distinguishing features. *Color.* Body, forewings, legs pale (Fig. 17A). Eyes with many ventral pigmented facets (Fig. 17C). *Structure.* Antennal segment III pedicel sub-basally angled, distally parallel, basal collar distinct and distally expanded (Fig. 17B). Head with the PO1 setae, OC3 setae in position 2A (Fig. 17D). Pronotum usually with 2 mAM setae (Fig. 17D). Upper surface of the hind coxae without microtrichia. Abdominal tergite VIII posteromarginal comb complete (Fig. 17E).

Interception frequency. Rare.

Region(s) of interceptions. North America, Central America and the Caribbean.

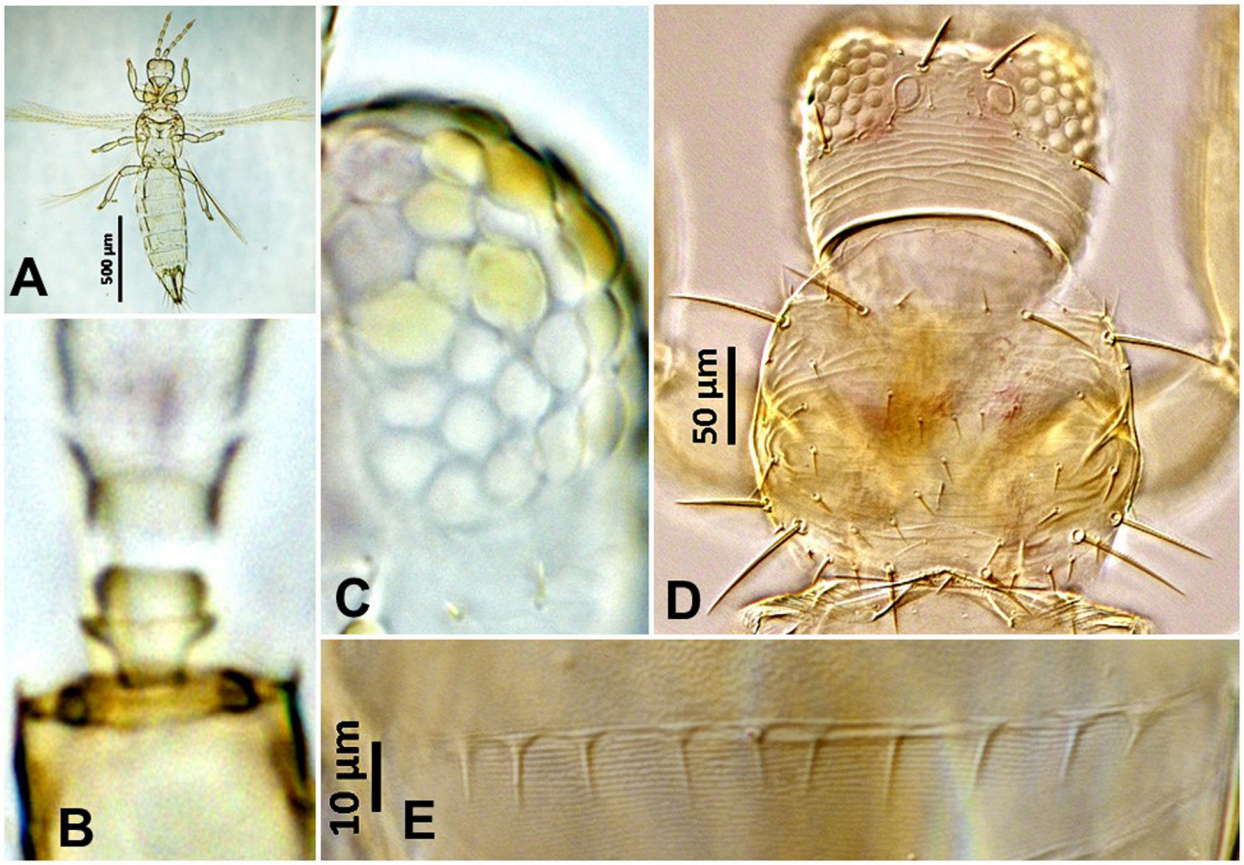

Figure 17. A–E) *Frankliniella borinquen*. **A)** Body. **B)** Antenna segment III basal collar and pedicel. **C)** Ventral eye. **D)** Head and pronotum. **E)** Abdominal tergite VIII posteromarginal comb.

Frankliniella brevicaulis Hood (Fig. 18)

Diagnosis. This species is quite similar to *F. parvula* Hood and *Frankliniella zeteki** Hood. The three can be differentiated by the shape of the antennal segment III pedicel. The basal portion of the pedicel of *F. brevicaulis* is cup-shaped (Fig. 18A); in *F. zeteki** the basal portion is nearly simple with obtuse lateral angles and distal to the angles is cup-shaped (Fig. 18B), and in *F. parvula* the basal portion of the pedicel has small acute lateral angles and is distally elongate.

Distinguishing features. *Color.* Body dark, forewings dark, basally paler, femora shaded, tibiae paler (Fig. 18C). Eyes without ventral pigmented facets. *Structure.* Antennal segment III pedicel cup-shaped (Fig. 18A). Head with the PO1 setae, OC3 setae in position 2A (Fig. 18D). Pronotum usually with 2 mAM setae (Fig. 18D). Upper surface of the hind coxae without microtrichia. Abdominal tergite VIII posteromarginal comb complete. (Fig. 18E).

Interception frequency. Rare.

Region(s) of interceptions. South America.

Comments. Banana flowers are a host of *F. brevicaulis* (Monzon et al. 2009).

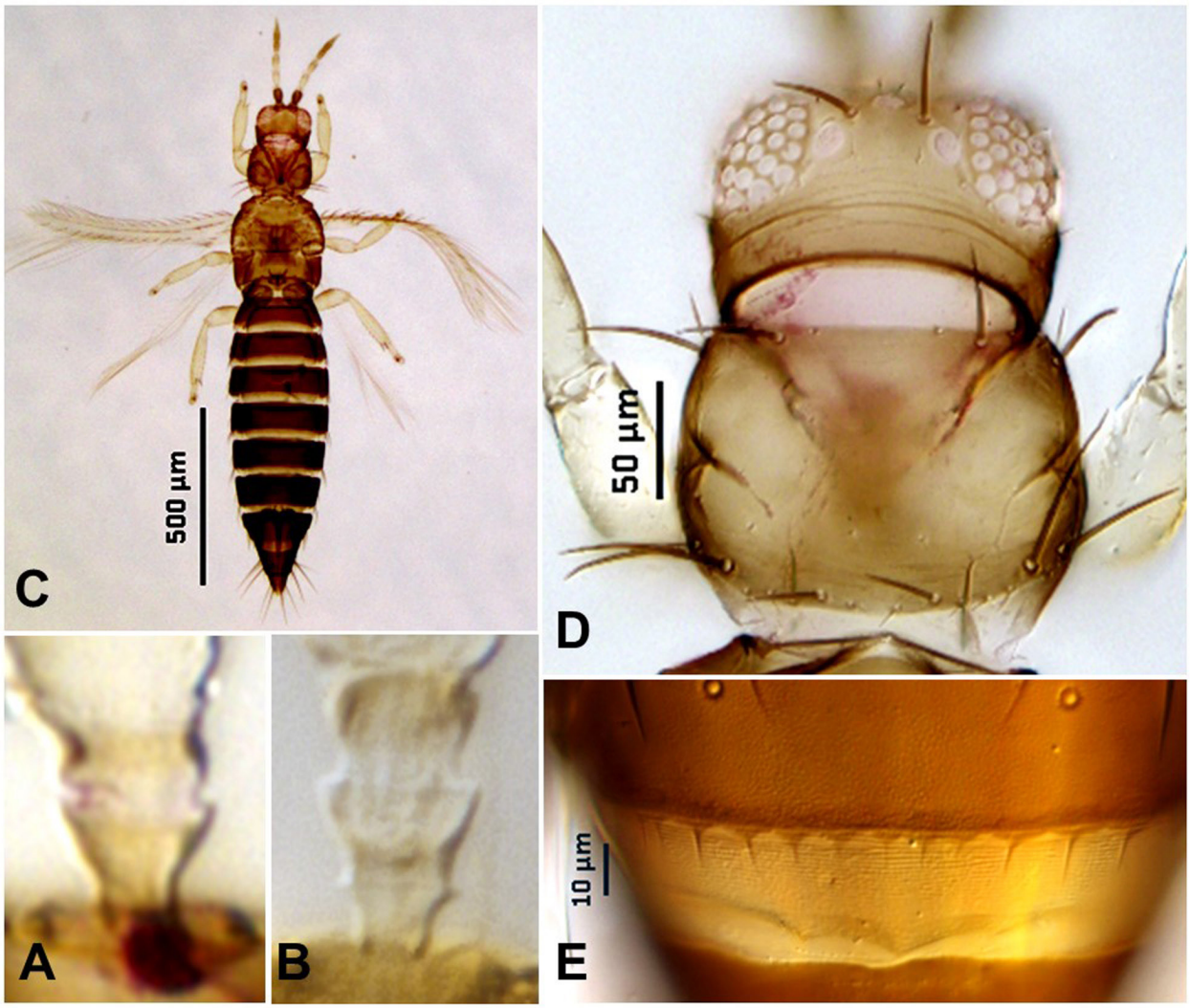

Figure 18. A–B) Pedicel of antennal segment III. **A)** *Frankliniella brevicaulis*. **B)** *Frankliniella zeteki*, holotype, USNM 74437. **C–E)** *Frankliniella brevicaulis*. **C)** Body. **D)** Head and pronotum. **E)** Abdominal tergite VIII posteromarginal comb.

Frankliniella breviseta Moulton (Fig. 19)

Distinguishing features. *Color.* Body pale to intermediate, abdominal tergites with darker medial shading, forewings, legs pale (Fig. 19A). Pigmented ventral eye facets with the 0-1-2 pattern. *Structure.* Antennal segment III pedicel angulate, saucer-shaped (Fig. 19B), basal collar indistinct. Head with the PO1 setae, OC3 setae in position 2B (Fig. 19C). Pronotum usually with 2 mAM setae. Upper surface of the hind coxae without microtrichia. Abdominal tergite VIII posteromarginal comb incomplete. (Fig. 19D).

Interception frequency. Rare.

Region(s) of interceptions. Central America and the Caribbean.

Comments. Mound and Marullo (1996) treated *F. breviseta* as unusual amongst the *Frankliniella* because it possesses a dilated pedicel but has short OC3 setae. Indeed, the OC3 setae of the holotype specimen are approximately 15 µm but Moulton (1948) reported *F. breviseta* with the OC3 pair of setae 33–40 µm and Sakimura (1986) evidenced by his identification key, concurred with Moulton (1948).

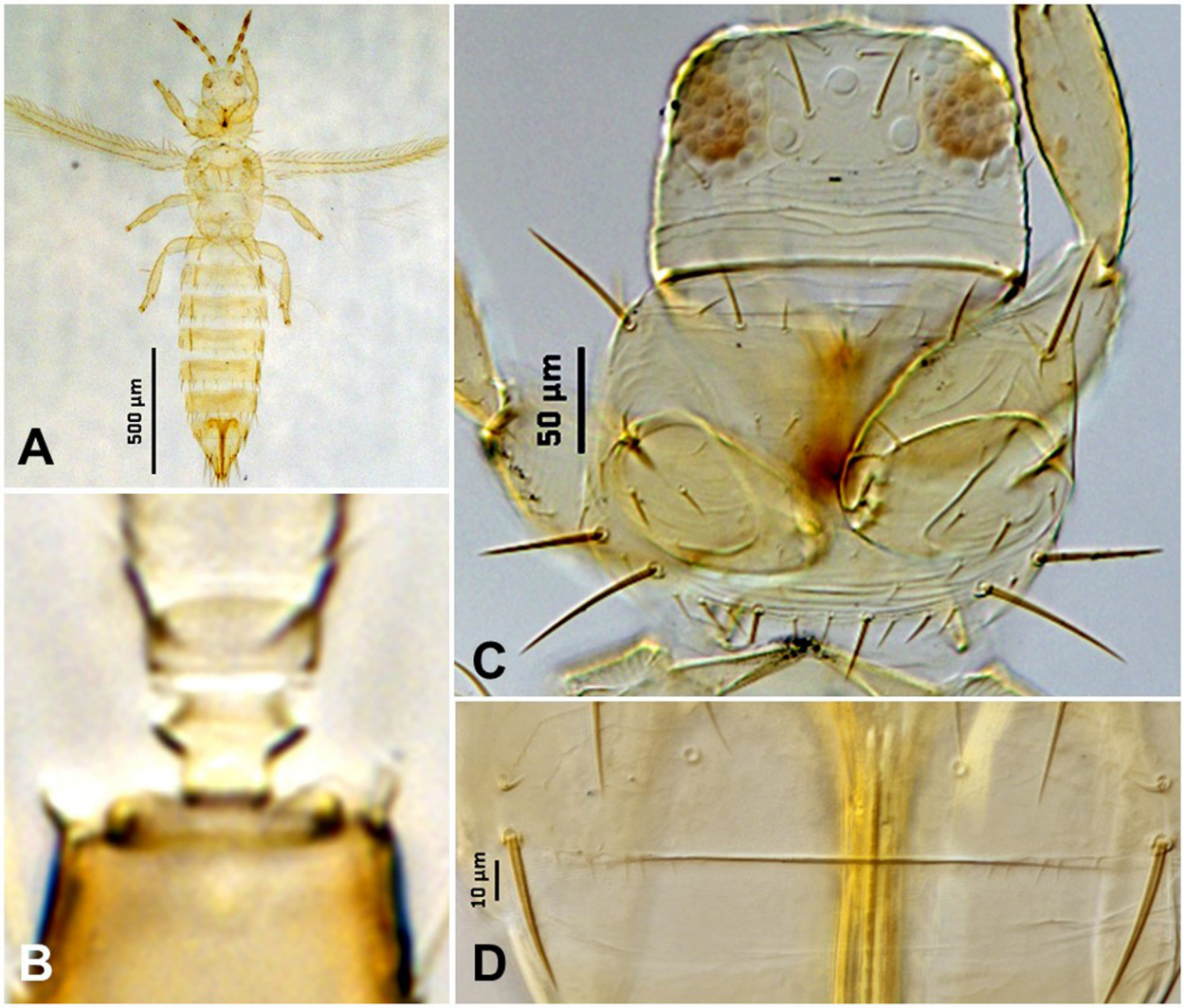

Figure 19. A–D) *Frankliniella breviseta*. **A)** Body. **B)** Pedicel of antennal segment III. **C)** Head and pronotum. **D)** Abdominal tergite VIII posteromarginal comb.

Frankliniella bruneri (Watson) (Fig. 20)

Diagnosis. Similar to *Frankliniella crotolariae** Mound and Marullo and paler forms of *F. occidentalis.* The antennal segment VIII of *F. bruneri* is shorter than VIII of *F. crotolariae** and *F. occidentalis*. Specimens interpreted here as *F. bruneri* have well developed microtrichia on the upper hind coxae whereas *F. crotolariae** has several minute microtrichia and *F. occidentalis* usually lacks microtrichia.

Distinguishing features. *Color.* Body, forewings, legs pale, occasionally, abdominal tergites with small dark anteroangular spots (Fig. 20A). Pigmented ventral eye facets with the 0-1-2 pattern. *Structure.* Antennal segment VIII about two times longer than wide (Fig. 20B). Head with the PO1 setae, OC3 setae in position 2B (Fig. 20C). Pronotum usually with 4 mAM setae (Fig. 20C). Upper surface of the hind coxae with microtrichia (Fig. 20D). Abdominal tergite VIII posteromarginal comb complete.

Interception frequency. Uncommon.

Region(s) of interceptions. North America, Central America and the Caribbean.

Comments. Molecular data by Skarlinsky and Rugman–Jones (2023) revealed that what is morphologically interpreted as *F. bruneri* consists of a complex of cryptic species.

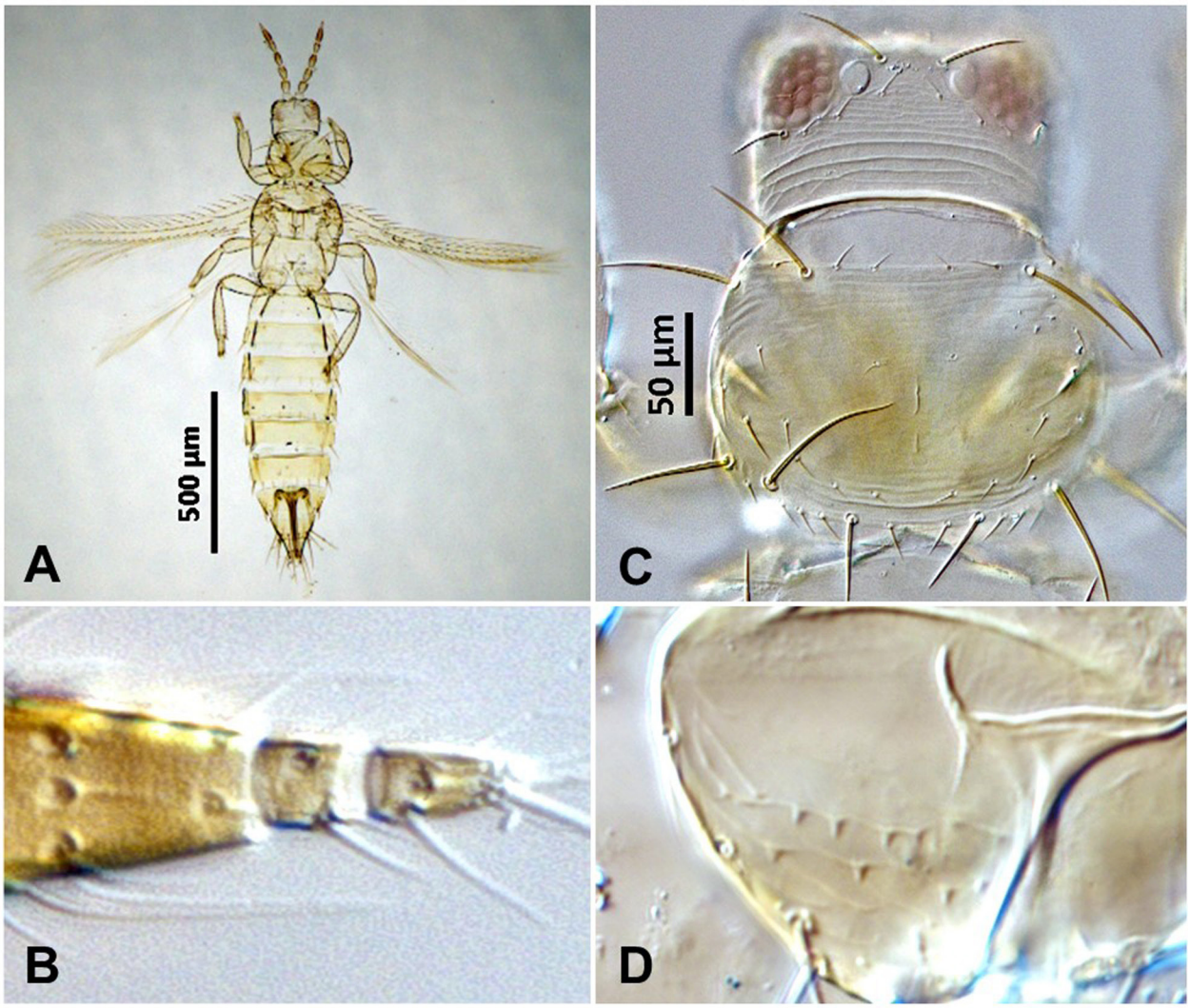

Figure 20. A–D) *Frankliniella bruneri* **A)** Body. **B)** Antennal segments VI–VIII. **C)** Head and pronotum. **D)** Upper surface of a hind coxa.

Frankliniella brunnea Priesner (Fig. 21)

Diagnosis. The smaller size of *F. brunnea* compared to other dark body species and its compact antennal segments are similar to members of the minuta series group.

Distinguishing features. *Color.* Body dark, forewings dark, legs with all femora dark, foretibiae paler than mid and hind tibiae (Fig. 21A). Eyes with many ventral pigmented facets (Fig. 21B). *Structure.* Antennal segment III pedicel distally swollen; mushroom-shaped, basal collar indistinct (Fig. 21C). Head usually without the PO1 setae, OC3 setae in position 2A (Fig. 21D). Pronotum usually with 2 mAM setae (Fig. 21D). Upper surface of the hind coxae with minute microtrichia (Fig. 21E). Abdominal tergite VIII posteromarginal comb complete.

Interception frequency. Rare.

Region(s) of interceptions. North America.

Comments. This species is usually associated with flowers of Asteraceae (Mound and Marullo 1996).

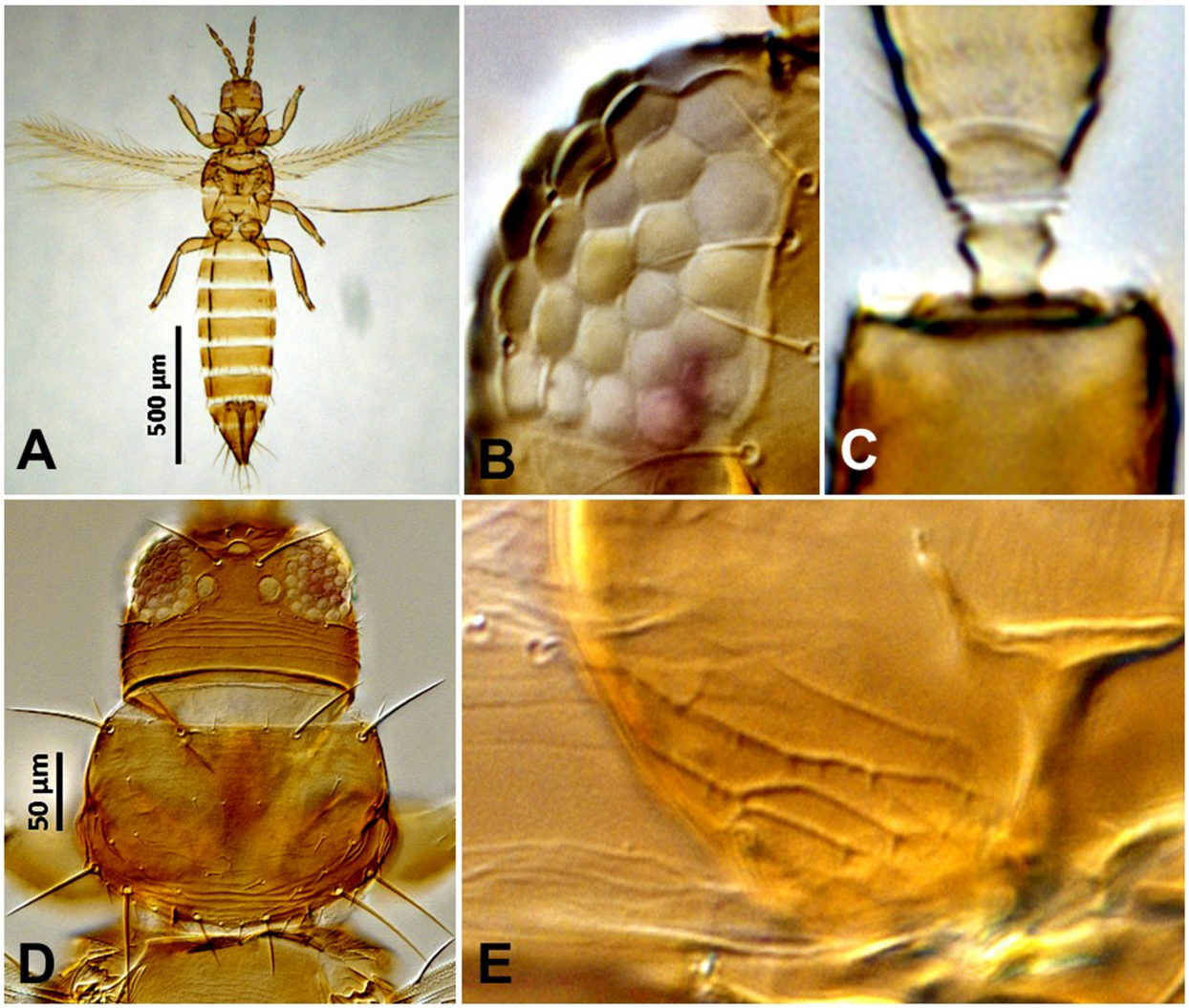

Figure 21. A–E) *Frankliniella brunnea*. **A)** Body. **B)** Ventral eye. **C)** Pedicel of antennal segment III. **D)** Head and pronotum. **E)** Upper surface of a hind coxa.

Frankliniella cephalica (D.L. Crawford) (Fig. 22)

Diagnosis. This pale species is similar to *F. bispinosa.* Both possess a distinct distally widened basal collar on antennal segment III, a swollen pedicel and two enlarged spine-like distal setae on antennal segment II. The antennal segment III pedicel of *F. cephalica* has basal lateral margins that diverge to acute points, creating small lateral shelves on each side whereas on *F. bispinosa* the basal and distal outer margins of the pedicel converge to a common point.

Distinguishing features. *Color.* Body, forewings, legs pale (Fig. 22A). Eyes with many ventral pigmented facets. *Structure.* Antennal segment III pedicel sub-basally angulate laterally, distal half slightly convergent apically and basal collar distinct and distally expanded (Fig. 22B), segment II with a distal pair of stout setae arising from protruding bases. Head with the PO1 setae, OC3 setae in position 2A (Fig. 22C). Pronotum usually with 2 mAM setae (Fig. 22C). Upper surface of the hind coxae without microtrichia. Abdominal tergite VIII posteromarginal comb incomplete.

Interception frequency. Uncommon.

Region(s) of interceptions. North America, Central America and the Caribbean.

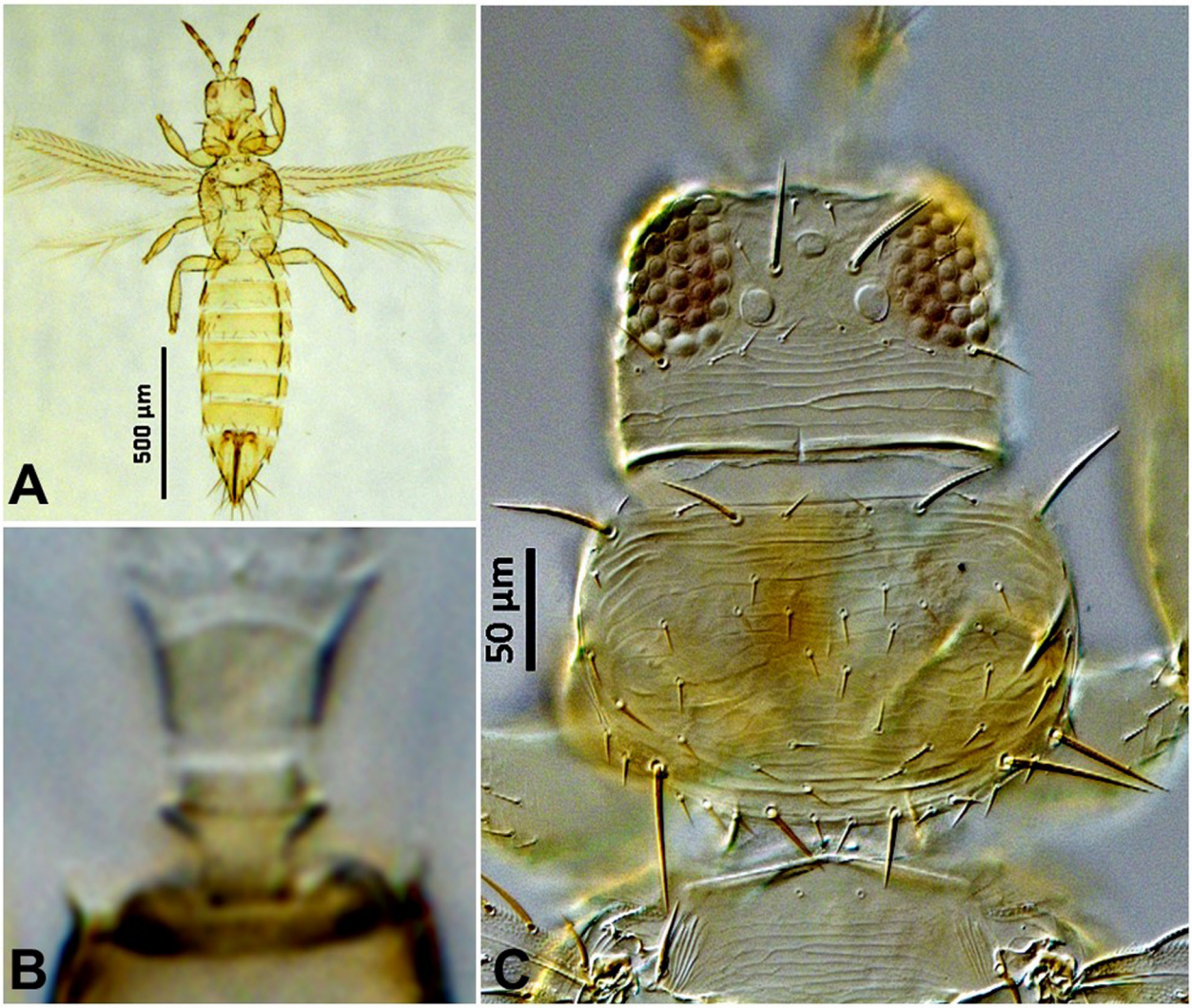

Figure 22. A–C) *Frankliniella cephalica.* **A)** Body. **B)** Pedicel and basal collar of antennal segment III. **C)** Head, pronotum and mesonotum.

Frankliniella citripes Hood (Fig. 23)

Diagnosis. A cluster of 4–6 small subapical, dorsal setae on antennal segment VI distinguishes this species from the similar *F. auripes*, *F. fulvipes**, *F. incerta*,* and *F. sanramona**.

Distinguishing features. *Color.* Body dark, forewings dark, basally pale, legs with all tibiae and tarsi pale (Fig. 23A). *Structure.* Antennal segment VI with 4–6 small subapical dorsal setae on large bases (Fig. 23B). Head with the PO1 setae, OC3 setae in position 2B. Pronotum with 2 mAM setae (Fig. 23C). Upper surface of the hind coxae with microtrichia (Fig. 23D). Abdominal tergite VIII posteromarginal comb complete, microtrichia 5–9 µm.

Interception frequency. Rare.

Region(s) of interceptions. Central America and the Caribbean.

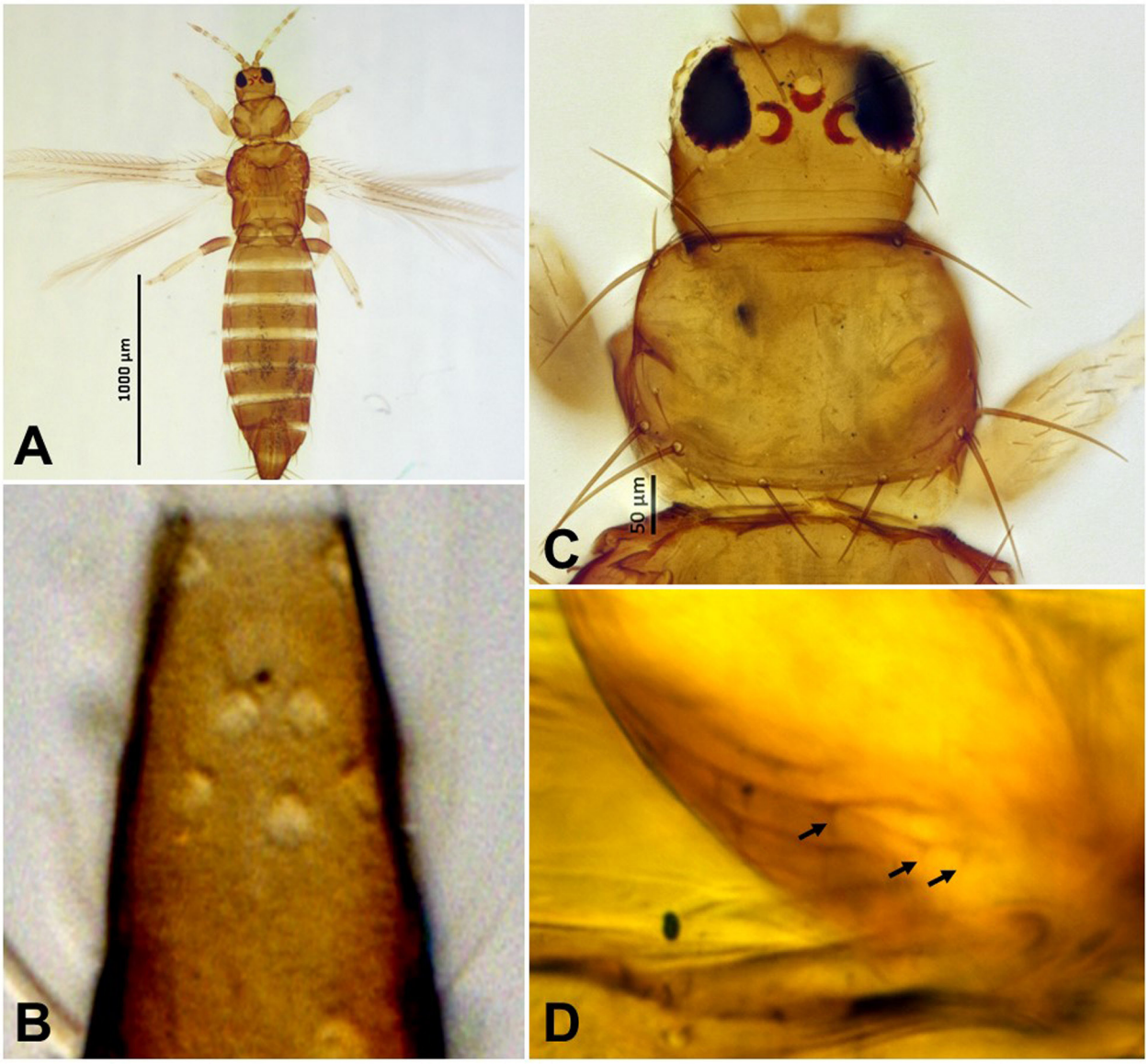

Figure 23. A–D) *Frankliniella citripes,* holotype, USNM 74422. **A)** Body. **B)** Dorsal subapical region of antennal segment VI. **C)** Head and pronotum. **D)** Upper surface of a hind coxa. Arrows indicate microtrichia.

Frankliniella cognata Hood (Fig. 24)

Diagnosis. Similar to *Frankliniella xanthaner* Hood. The longer pronotal setae and fewer mAM setae separates *F. cognata* from *F. xanthaner*.

Distinguishing features. *Color.* Body dark, forewings dark, basally pale, legs dark, fore tibiae paler, mid and hind tibiae dark, basally paler at the tibiae-femora junction (Fig. 24A). *Structure.* Antennal segment VI with a subapical, dorsal transverse line of 3 small setae on large bases (Fig. 24B). Head with the PO1 setae, OC3 setae in position 2B (Fig. 24C). Pronotum with 2 mAM setae (Fig. 24C). Abdominal tergite I discal sculpture faint between the campaniform sensilla. Upper surface of the hind coxae with microtrichia. Abdominal tergite VIII posteromarginal comb complete, microtrichia 20–24 µm (Fig. 24D).

Interception frequency. Rare.

Region(s) of interceptions. South America.

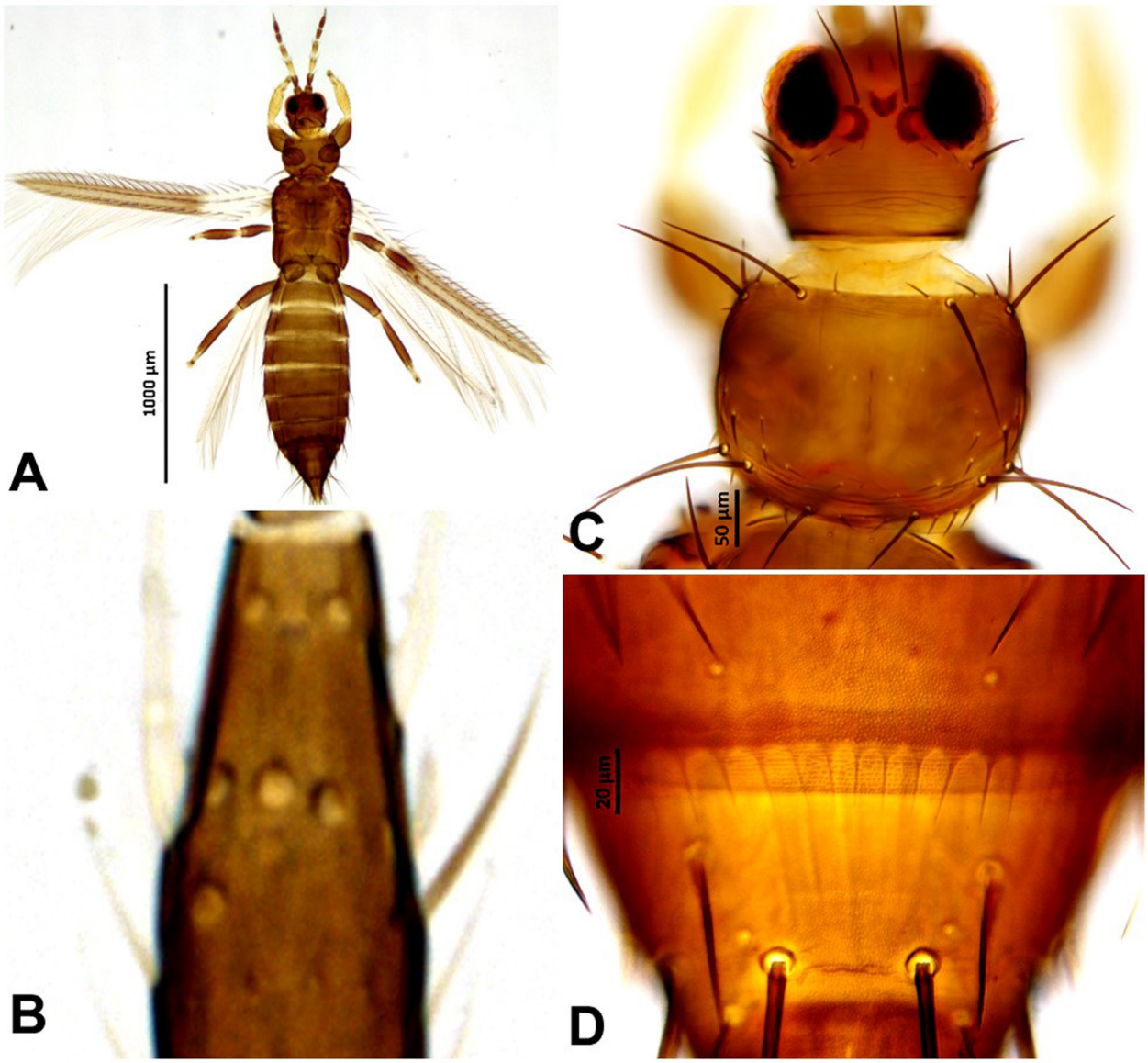

Figure 24. A–D) *Frankliniella cognata*, holotype, USNM 74430. **A)** Body. **B)** Dorsal subapical region of antennal segment VI. **C)** Head and pronotum. **D)** Abdominal tergite VIII posteromarginal comb.

Frankliniella colombiana Moulton.

Diagnosis. This species is a member of the minuta series group which that have short OC3 setae and rather compact antennal segments. It is characterized from other species in the group by having a ventrally directed mouth cone (Sakimura and O'Neill 1979).

Distinguishing features. *Color.* Body, forewings, legs dark with foretibiae paler. *Structure.* Head without the PO1 setae, OC3 setae short and in position 2B. Pronotum with 2 mAM setae. Metanotum with campaniform sensilla. Upper surface of the hind coxae with microtrichia. Abdominal tergite VIII posteromarginal comb complete.

Interception frequency. Rare.

Region(s) of interceptions. South America.

Frankliniella cubensis Hood (Fig. 25)

Distinguishing features. *Color.* Body, forewings, legs pale (Fig. 25A). Pigmented ventral eye facets with 0-1-2 pattern. *Structure.* Antennal segment III pedicel similar to a saucer surmounted by a narrower cup. The acute angles of the expanded margins appear as small shelves on each side of the pedicel (Fig. 25B). Head usually with the PO1 setae, OC3 setae in position 2B (Fig. 25C). Pronotum usually with 2 mAM setae (Fig. 25C). Upper surface of the hind coxae with microtrichia. Abdominal tergite VIII posteromarginal comb complete, microtrichia 10–14 µm.

Interception frequency. Rare.

Region(s) of interceptions. Central America and the Caribbean.

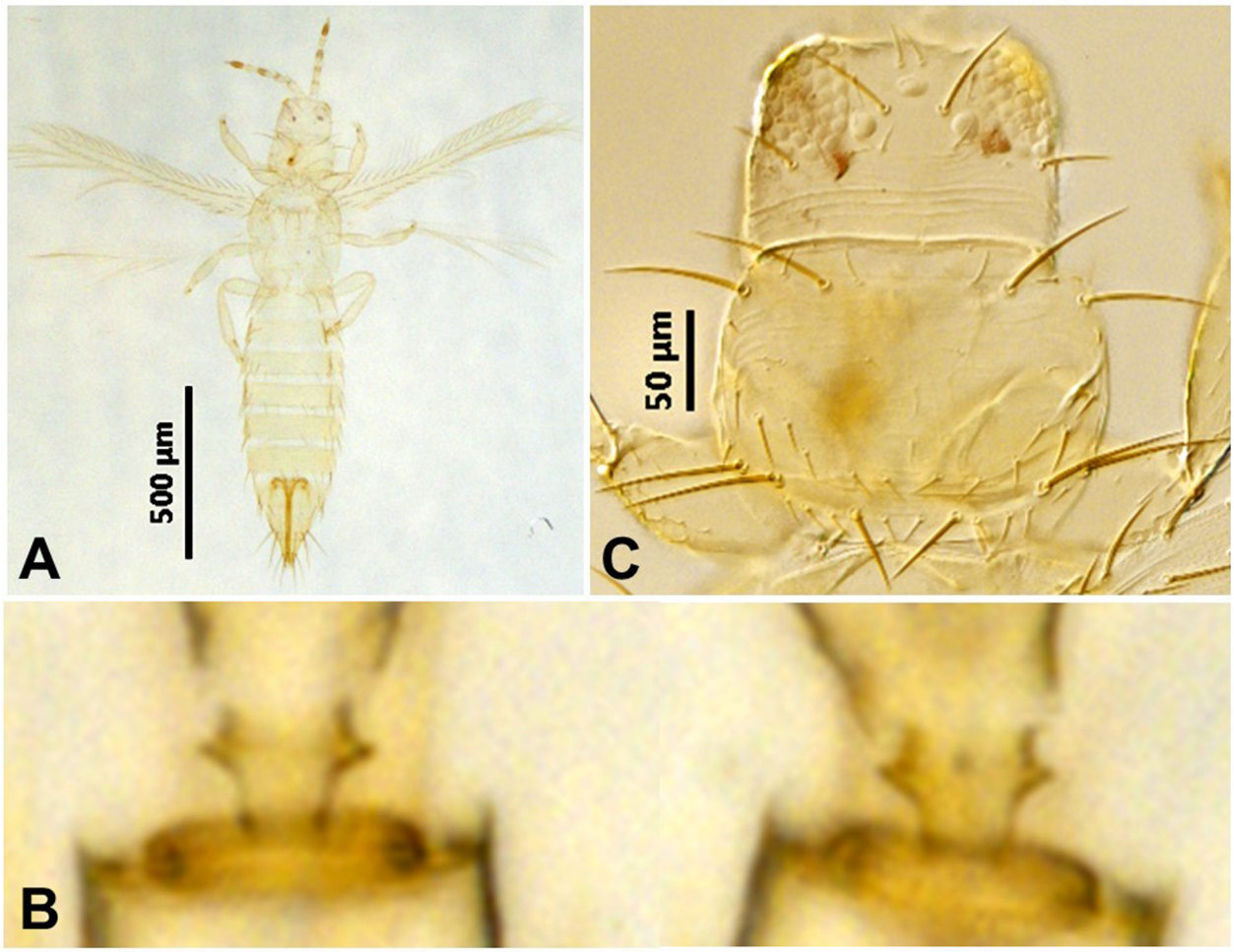

Figure 25. A–C) *Frankliniella cubensis*. **A)** Body. **B)** Left and right pedicel of antennal segments III. **C)** Head and pronotum.

Frankliniella desmodii Mound and Marullo (Fig. 10A, 26)

Diagnosis. *Frankliniella desmodii* belongs to a cohort of species characterized by having a long buccal cone and is similar to *Frankliniella rostrata** Preisner and *Frankliniella lantanae** Mound, Nakahara, and Day.

Distinguishing features. *Color.* Body, forewings, legs pale. Usually, the abdominal tergites have dark anteroangular blotches (Fig. 26A). Pigmented ventral eye facets with the 1-1-2 pattern. *Structure.* The antennal segment VIII of *F. desmodii* is approximately 4 times longer than its width. Head with an elongate mouth cone, longer than the width of the head (Fig. 10A), usually without the PO1 setae, OC3 setae in position 2A (Fig. 26B). Pronotum usually with 4 mAM setae (Fig. 26B). Upper surface of the hind coxae with microtrichia (Fig. 26C). Abdominal tergite VIII posteromarginal comb complete, microtrichia 10–14 µm (Fig. 26D).

Interception frequency. Rare.

Region(s) of interceptions. North America.

Comments. Mound and Marullo (1996) reported *F. desmodii* was found on the leaves of *Desmodium intortum* and not the flowers.

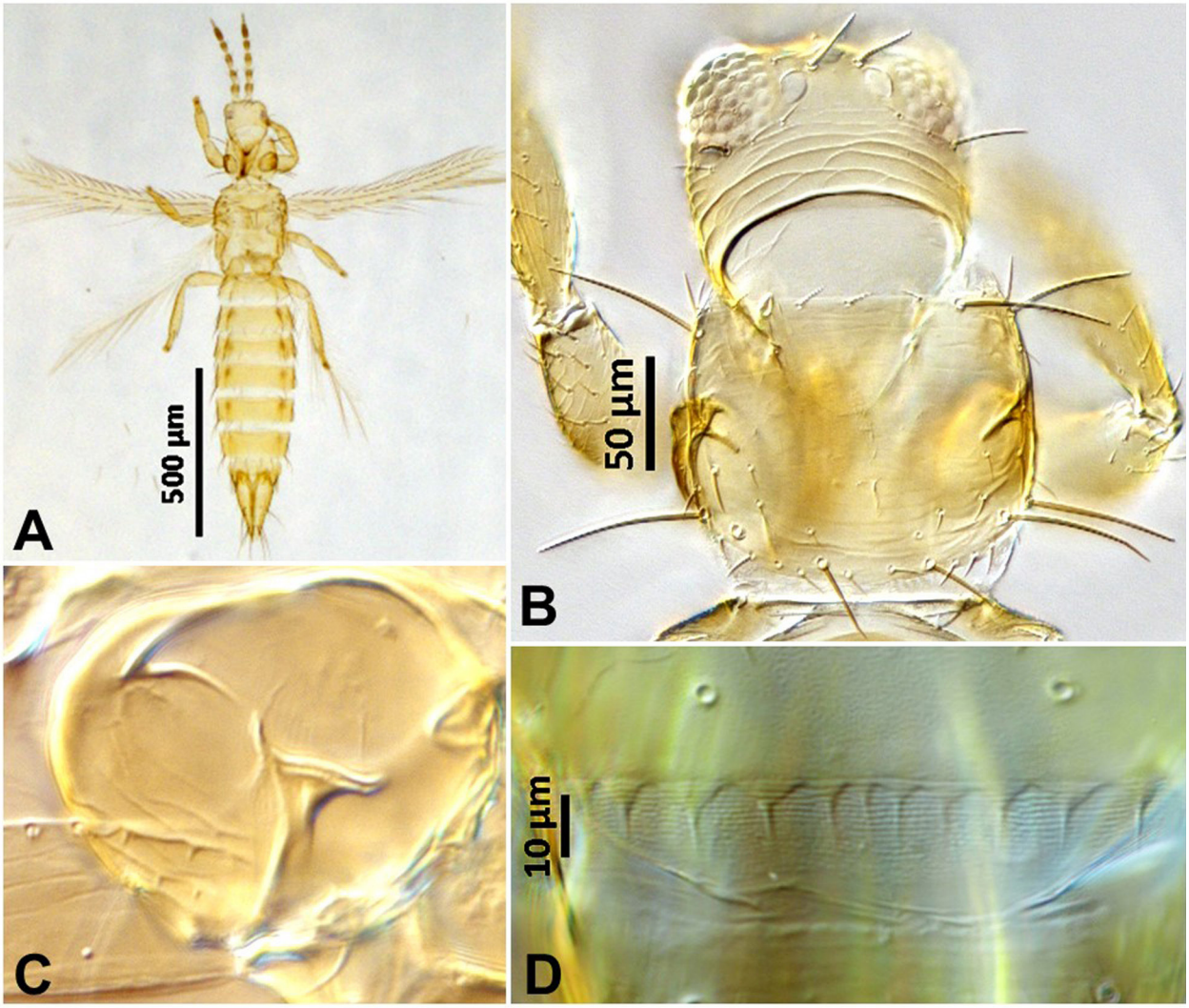

Figure 26. A–D) *Frankliniella desmodii*. **A)** Body. **B)** Head and pronotum. **C)** Upper surface of a hind coxa. **D)** Abdominal tergite VIII posteromarginal comb.

Frankliniella ecuatoriana Skarlinsky and Rugman-Jones (Fig. 27)

Diagnosis. *Frankliniella ecuatoriana* is similar to *Frankliniella alonsoae** Hood. The fore tibiae of *F. alonsoae** are dark, in contrast the fore tibiae of *F. ecuatoriana* are paler. Also, the males of *F. alonsoae** are uniformly dark and those of *F. ecuatoriana* are dark with a pale translucent pronotum.

Distinguishing features. *Color*. Head, thorax and abdomen dark. Legs with all femora dark, foretibiae pale, middle and hind tibiae dark, slightly paler at the tibia-femur junction (Fig. 27A). Pigmented ventral eye facets with the 1-2-2 pattern (Fig. 27B). *Structure.* Antennal segment VI with 3 small setae on large bases lying transversely between the outer and inner sense cones. Head with the PO1, OC3 setae in position 2B (Fig. 27C). Pronotum with 4 mAM setae (Fig. 27C). Upper surface of the hind coxae with several small microtrichia. Abdominal tergite XIII posteromarginal comb complete, microtrichia 18–24 µm (Fig. 27D).

Interception frequency. Rare.

Region(s) of interceptions. South America.

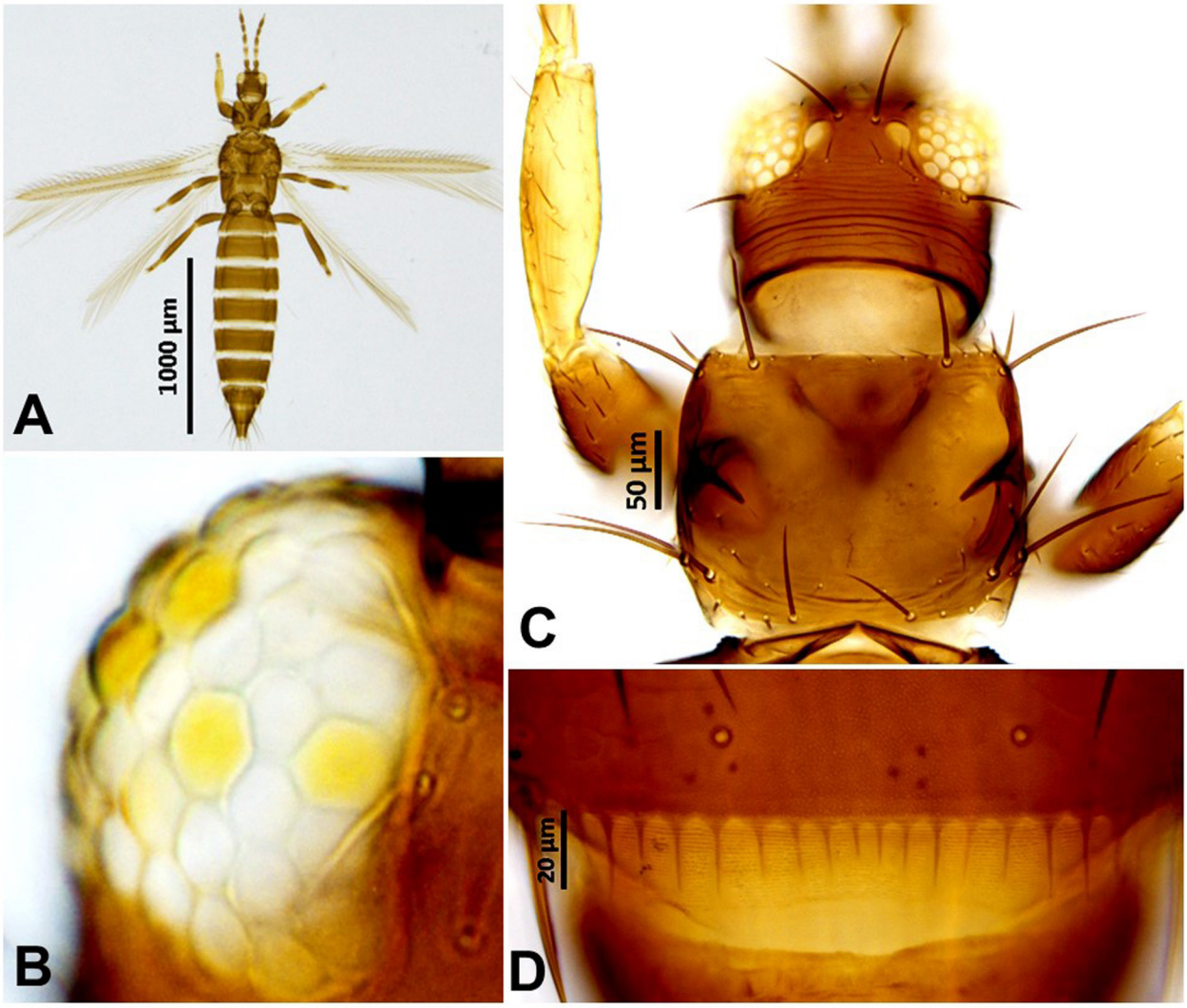

Figure 27. A–D) *Frankliniella ecuatoriana*, holotype, USNM 01207663. **A)** Body. **B)** Ventral eye. **C)** Head and pronotum. **D)** Abdominal tergite VIII posteromarginal comb.

Frankliniella fallaciosa Priesner (Fig. 28)

Distinguishing features. *Color.* Body dark, forewings dark, basally pale, legs with all femora dark, foretibia pale, mid tibiae dark and hind tibiae basally light or entirely dark (Fig. 28A). Pigmented ventral eye facets with the 1-1-2 pattern. *Structure.* Head usually with the PO1 setae, OC3 setae in position 2B (Fig. 28B). Pronotum with 2–4 mAM setae (Fig. 28B). Upper surface of the hind coxae with several or no microtrichia (Fig. 28C). Abdominal tergite VIII posteromarginal comb complete.

Interception frequency. Uncommon.

Region(s) of interceptions. North America, Central America and the Caribbean.

Comments. This dark species was interpreted as highly variable (Mound and Marullo 1996) and Priesner (1933) reported the shading of the hind tibiae varies from completely dark to having a basal yellow ring.

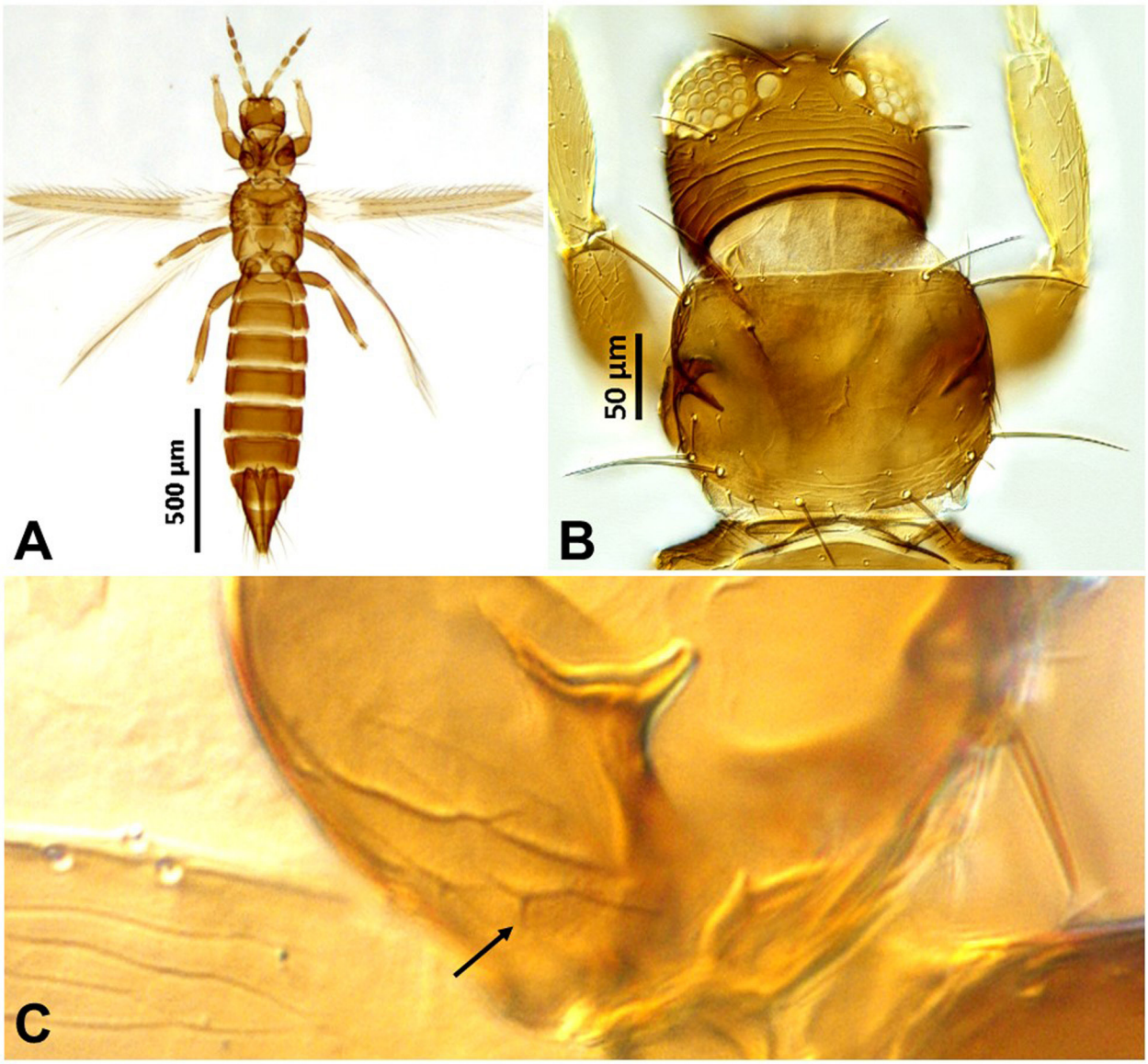

Figure 28. A–C) *Frankliniella fallaciosa* **A)** Body. **B)** Head and pronotum. **C)** Upper surface of a hind coxa. Arrow indicates a microtrichium.

Frankliniella fulvipennis Moulton (Fig. 3B, 29)

Diagnosis. This species belongs to a group of *Frankliniella* characterized by possessing several anterior and ventral compound eye facets that are nearly twice the diameter of other facets.

Distinguishing features. *Color.* Body dark, forewings dark, legs with all femora dark, foretibiae pale, mid and hind tibiae indistinctly shaded (Fig. 29A). *Structure.* Compound eyes with 3–5 enlarged anterolateral and ventral facets (Fig. 29B). Head usually with the PO1 setae, OC3 setae in position 2B (Fig. 29C). Pronotum usually with 2 mAM setae (Fig. 29C). Upper surface of the hind coxae with microtrichia. Abdominal tergite VIII posteromarginal comb complete. (Fig. 29D).

Interception frequency. Uncommon.

Region(s) of interceptions. North America, Central America and the Caribbean.

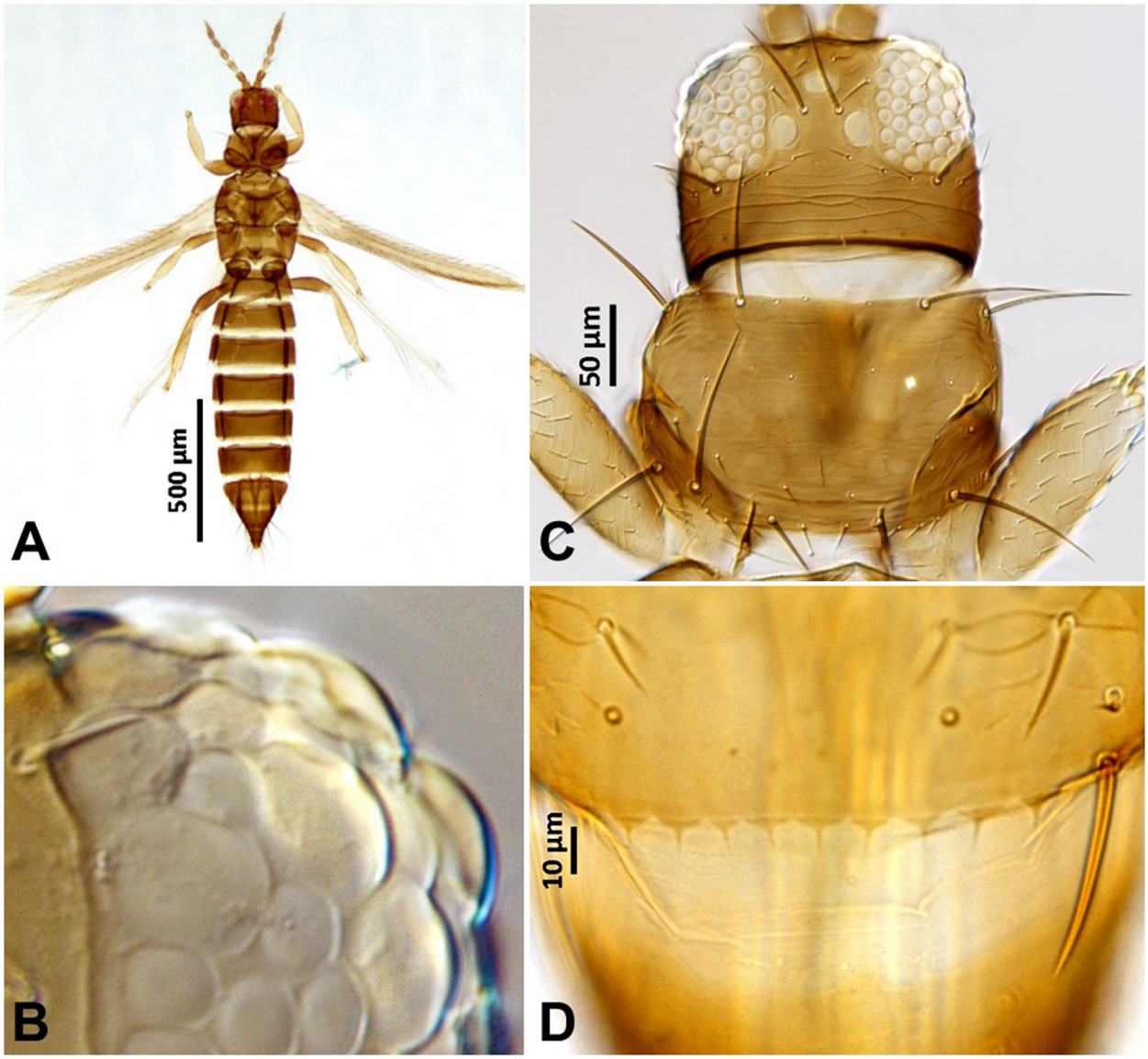

Figure 29. A–D) *Frankliniella fulvipennis*. **A)** Body. **B)** Ventral eye. **C)** Head and pronotum. **D)** Abdominal tergite VIII posteromarginal comb.

Frankliniella funderburki Skarlinsky and Rugman-Jones (Fig. 30)

Diagnosis. This pale species belongs to a group of congeners characterized by having an expanded antennal segment III pedicel and a complete abdominal segment VIII posteromarginal comb. The shape of the antennal segment III pedicel on *F. funderburki* is similar to the pedicel found on *F. cubensis* whereas the basal collar is similar to that found on *Frankliniella invasor* Sakimura. Although quite similar to these species, a pair of stout dorsal distal setae on the antennal segment II of *F. funderburki* readily distinguishes it from *F. invasor* and *F. cubensis*.

Distinguishing features. *Color.* Head, thorax and abdomen pale, legs pale (Fig. 30A). Pigmented ventral eye facets with 0-1-2 pattern. *Structure.* Antennal segment II with a pair of stout dorsal distal setae arising from elevated bases (Fig. 30B), segment III pedicel expanded with acute angles on the lateral margins that form short shelves on each side of the pedicel (Fig. 30C). Head with the PO1 setae, OC3 setae in position 2B (Fig 30B). Pronotum with 2 mAM setae. Upper surface of the hind coxae with microtrichia. Abdominal tergite VIII posteromarginal comb complete, microtrichia 18–24.

Interception frequency. Rare.

Region(s) of interceptions. Central America and the Caribbean.

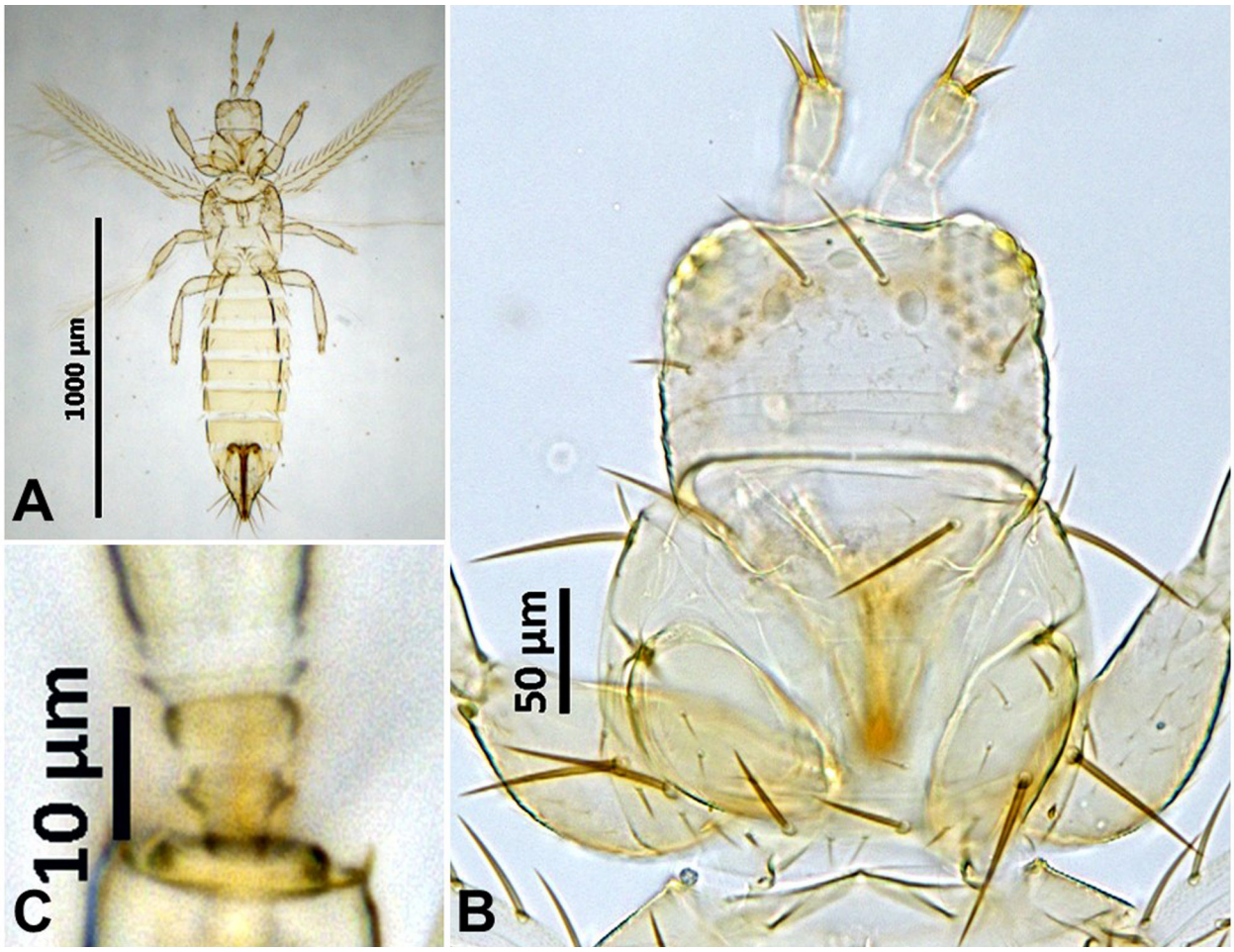

Figure 30. A–C) *Frankliniella funderburki*, holotype, USNM 01207579. **A)** Body. **B)** Antennal segments I and II, head and pronotum. **C)** Antennal segment III basal collar and pedicel.

Frankliniella fusca (Hinds) (Fig. 31)

Diagnosis. This polymorphic species can be pale or dark and macropterous (Fig. 31A) or micropterous. (Fig. 31B).

Distinguishing features. *Color.* Body pale to dark, forewings (macropterous form), pale to dark, if dark, basally pale, legs with all femora dark and all tibiae shaded (Fig. 31A, 31B). Pigmented ventral eye facets with the 1-1-2 pattern. *Structure.* Head usually without the PO1 setae, OC3 setae in position 2a (Fig. 31C). Pronotum with 2–4 mAM setae (Fig. 31C). Metanotum with reticulate sculpture medially (macropterous) or transverse reticulate sculpture (micropterous). Abdominal tergite VIII posteromarginal comb incomplete (Fig. 31D). Upper surface of the hind coxae without microtrichia.

Interception frequency. Uncommon.

Region(s) of interceptions. Asia, Central America and the Caribbean, Europe, North Africa and the Middle East, North America.

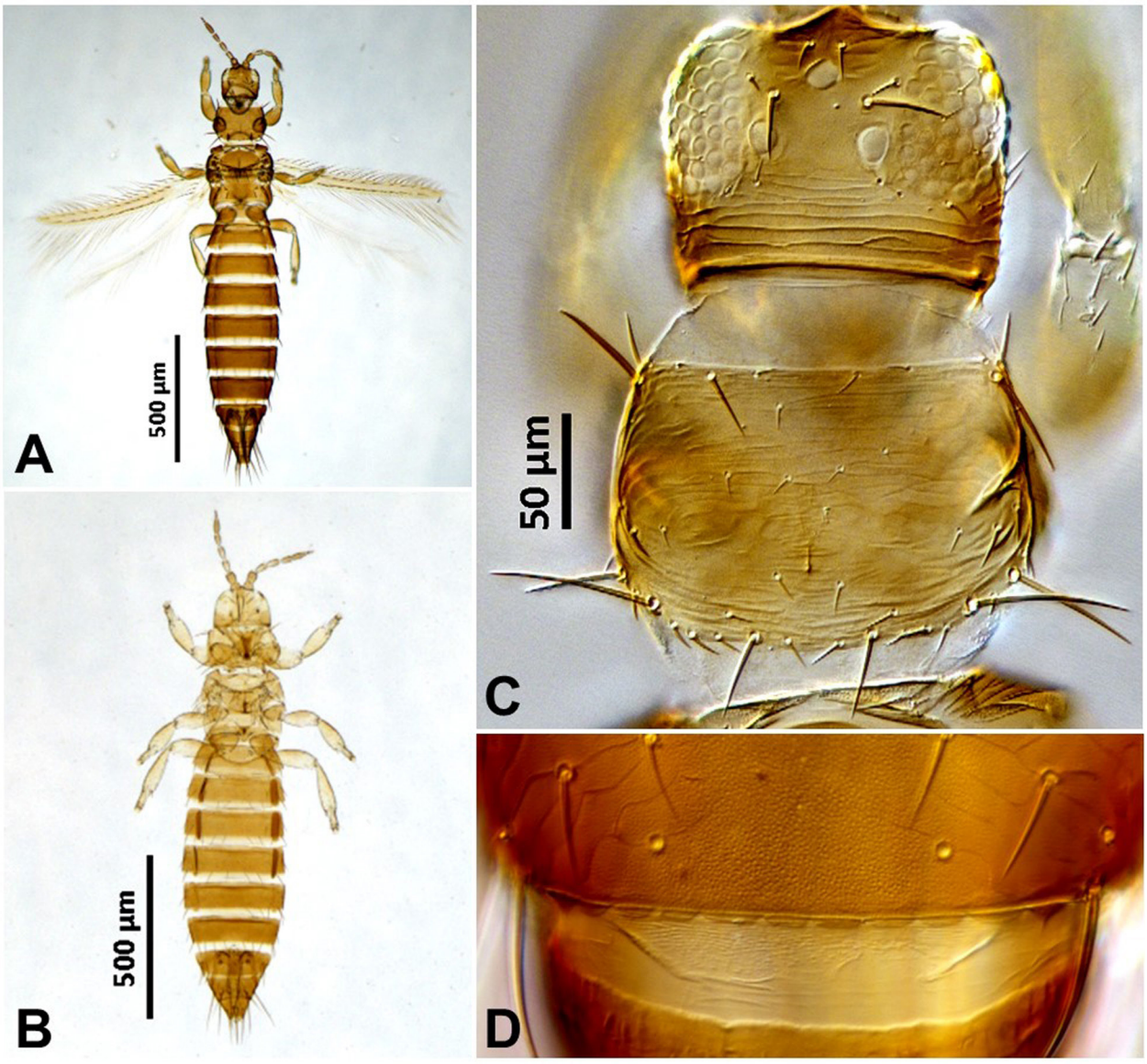

Figure 31. A–D) *Frankliniella fusca*. **A)** Macropterous form. **B)** Micropterous form. **C)** Head and pronotum. **D)** Abdominal tergite VIII posterior margin.

Frankliniella gardeniae Moulton (Fig. 32)

Diagnosis. The elongate shape of the antennal segment II distinguishes *F. gardenia*e from the similar *Frankliniella inca** Hood. Both possess a similar chalice-shaped pedicel and complete abdominal tergite VIII posteromarginal comb.

Distinguishing features. *Color.* Body, forewings, legs pale (Fig. 32A). Pigmented ventral eye facets with the 0-1-2 pattern. *Structure.* Antennal segment VII longer than wide (Fig. 32B), segment III basal collar indistinct, pedicel chalice-shaped, distal half weakly angled (Fig. 32C), segment II elongate (Fig. 32C). Head with the PO1 setae, OC3 setae in position 2B (Fig. 32D). Pronotum usually with 2 mAM setae (Fig. 32D). Upper surface of the hind coxae with microtrichia. Abdominal tergite VIII posteromarginal comb complete.

Interception frequency. Uncommon.

Region(s) of interceptions. Central America and the Caribbean.

Comments. The unique holotype specimen of *F. gardeniae* was presumably a US port of entry inspection interception.

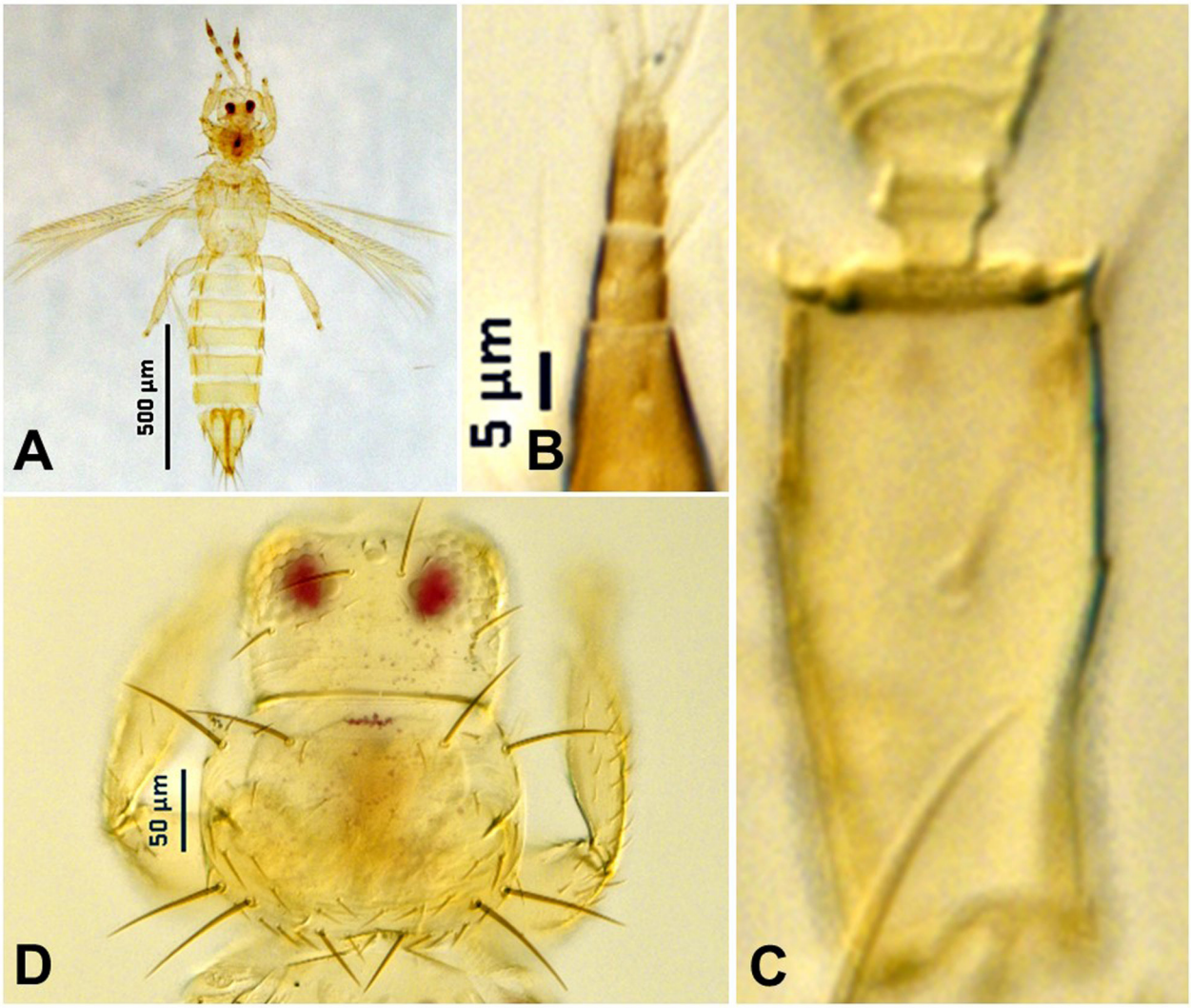

Figure 32. A–D) *Frankliniella gardeniae* **A)** Body. **B)** Antennal segments VI–VIII. **C)** Antennal segment II and pedicel of antennal segment III. **D)** Head and pronotum.

Frankliniella gemina Bagnall (Fig. 33)

Diagnosis. This pale species is similar to *Frankliniella gossypiana* (Morgan) and *Frankliniella suramericana* Skarlinsky and Rugman-Jones. The presence or absence of microtrichia on the upper hind coxae and discal setae on the abdominal sternite II separates the three similar congeners.

Distinguishing features. *Color.* Body, wings and legs pale (Fig. 33A). Pigmented ventral eye facets with the 1-1-2 pattern. *Structure.* Head with the PO1 setae, OC3 setae in position 2B (Fig. 33B). Pronotum usually with 4 mAM setae (Fig. 33C). Upper surface of the hind coxae with microtrichia. Abdominal sternite II without discal setae. Abdominal tergite VIII posteromarginal comb complete. Tergite IX B1 setae usually less than 100 µm (Fig. 33D).

Interception frequency. Uncommon.

Region(s) of interceptions. South America.

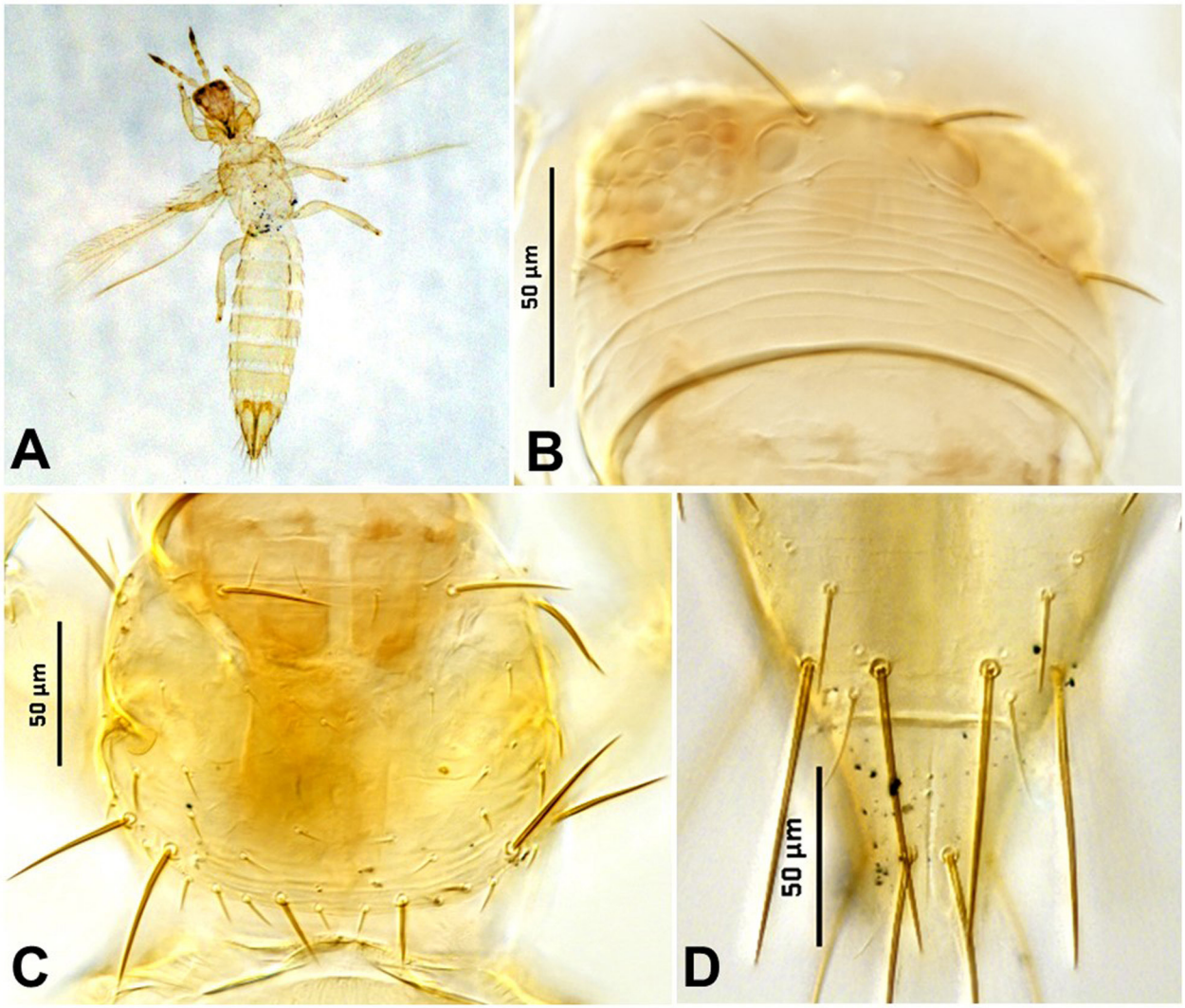

Figure 33. A–D) *Frankliniella gemina* **A)** Body. **B)** Head. **C)** Pronotum. **D)** Abdominal tergites IX and X.

Frankliniella gossypiana (Morgan) (Fig. 34)

Diagnosis. The absence of microtrichia on the upper surface of the hind coxae of *F. gossypiana* seems to be the only reliable way to separate this North American described species from the similar South American congeners *F. gemina* Bagnall and *F. suramericana*. Both *F. gemina* and *F. suramericana* possess microtrichia on the upper hind coxae.

Distinguishing features. *Color.* Body, forewings, and legs pale (Fig. 34A). Pigmented ventral eye facets with the 1-1-2 pattern. *Structure.* Antennal segment VIII about 2.5 times as long as wide. Head with the PO1 setae, OC3 setae in position 2B (Fig. 34B). Pronotum usually with 4 mAM (Fig. 34B). Upper surface of the hind coxae without microtrichia. Abdominal sternite II usually with at least one discal setae (Fig. 34C). Abdominal tergite posteromarginal VIII comb complete (Fig. 34D). Abdominal tergite IX, B1 setae usually less than 100 µm.

Interception frequency. Uncommon.

Region(s) of interceptions. North America, Central America and the Caribbean.

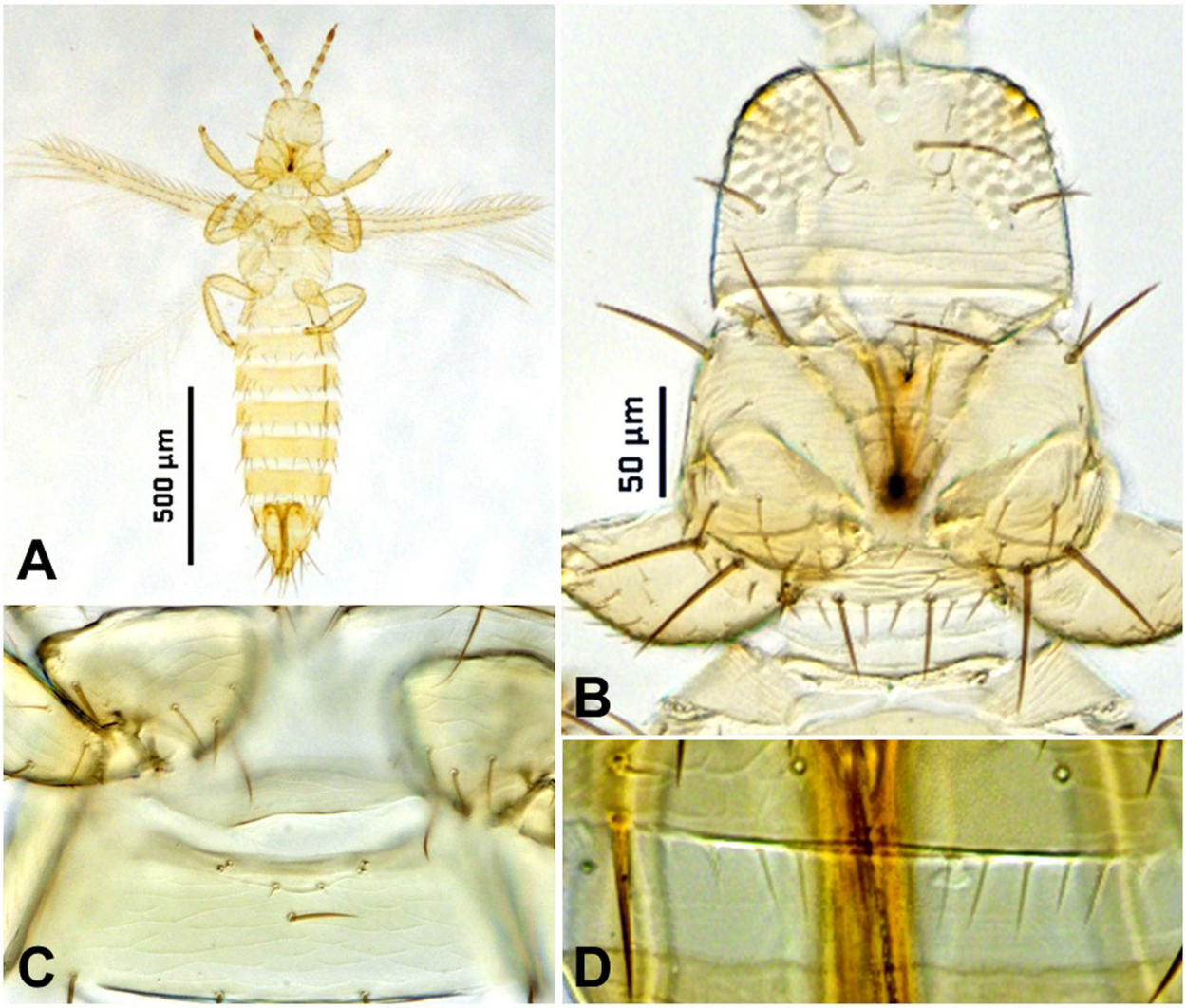

Figure 34. A–D) *Frankliniella gossypiana* **A)** Body. **B)** Head and pronotum. **C)** Hind coxae, abdominal sternites I and II. **D)** Abdominal tergite VIII posteromarginal comb.

Frankliniella hemerocallis Crawford (Fig. 35)

Distinguishing features. *Color.* Body dark, forewings dark, basally pale, legs with all femora dark, foretibiae pale, mid and hind tibiae darker medially, basally paler (Fig. 35A). Pigmented ventral eye facets with the 0-1-2 pattern. *Structure.* The apex of the head protrudes slightly forward of the anterior margin of the compound eyes. The PO1 setae may be present or absent, the PO4 setae are short, about the same length as the other postocular setae, OC3 setae position variable, either 2A or 2B (Fig. 35B). Pronotum usually with 2 mAM setae (Fig. 35B). Metanotum without campaniform sensilla (Fig. 35C). Upper surface of the hind coxae with microtrichia. Abdominal tergite VIII posteromarginal comb complete, microtrichia short and occasionally absent (Fig. 35D).

Interception frequency. Rare.

Region(s) of interceptions. Central America and the Caribbean.

Comments. This species has only been intercepted from daylily plants.

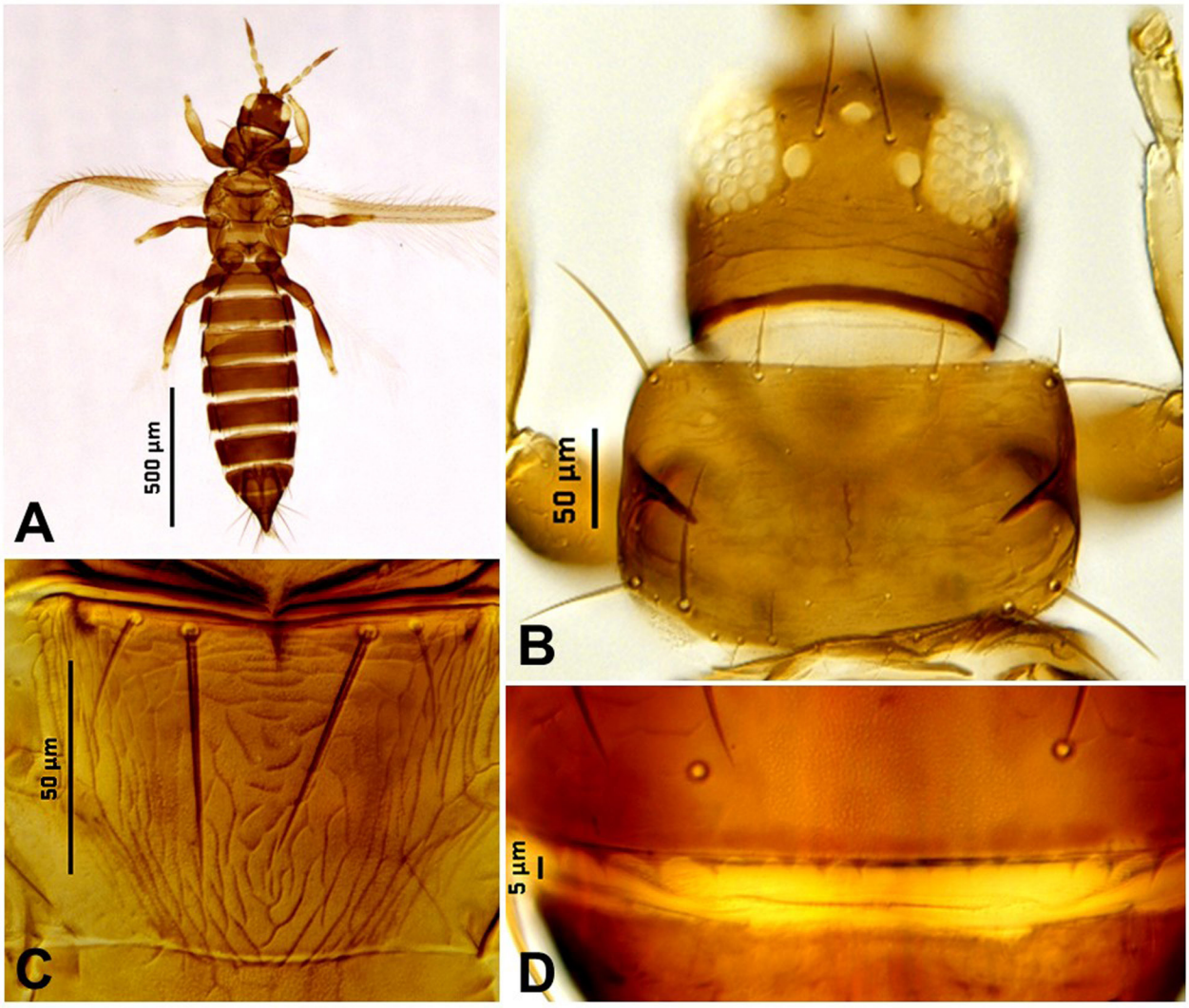

Figure 35. A–D) *Frankliniella hemerocallis*. **A)** Body. **B)** Head and pronotum. **C)** Metanotum. **D)** Abdominal tergite VIII posteromarginal comb.

Frankliniella insularis (Franklin) (Fig. 36)

Distinguishing features. *Color.* Body dark, forewings dark, basally pale, legs with femora dark, foretibiae pale, mid and hind dark (Fig. 36A). Pigmented ventral eye facets with the 1-1-2 pattern. *Structure.* Antennal segment VI sense cone base as wide as the width of segment VII (Fig. 36B). Head V-shaped, the PO1 setae are present and the OC3 setae are in position 2A (Fig. 36C). Pronotum with 2 mAM setae (Fig. 36C). Upper surface of the hind coxae with microtrichia. Abdominal tergite VIII comb usually without microtrichia medially, but occasionally shorter microtrichia may be evident medially (Fig. 36D, 36E).

Interception frequency. Common.

Region(s) of interceptions. North America, South America, Central America and the Caribbean.

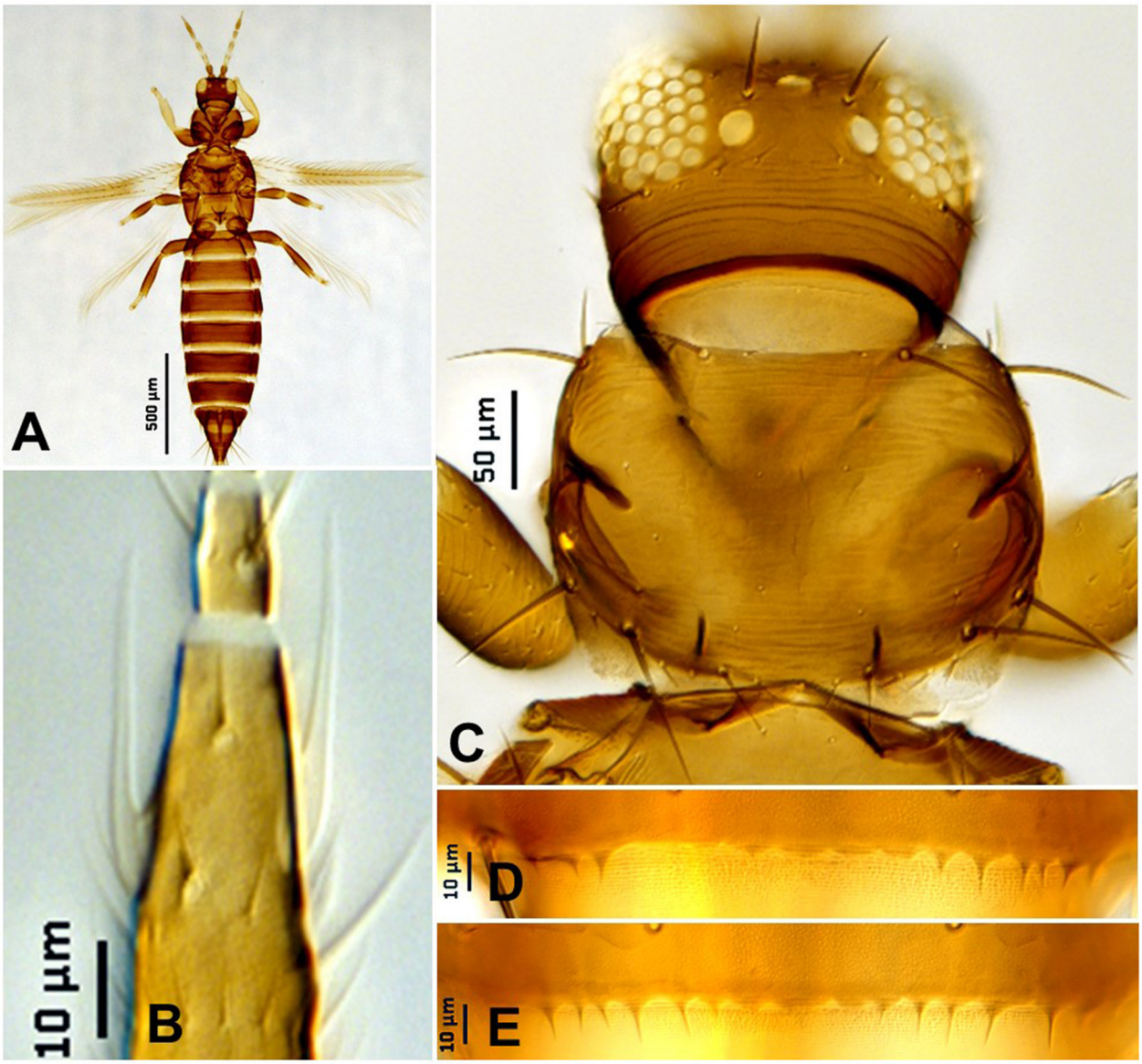

Figure 36. A–E) *Frankliniella insularis*. **A)** Body. **B)** Antennal segments VI and VII. **C)** Head and pronotum. **D–E)** Abdominal tergite VIII posteromarginal comb.

Frankliniella intonsa (Trybom) (Fig. 37)

Distinguishing features. *Color.* Body dark, forewings pale to lightly shaded, legs with femora dark, foretibiae pale, mid and hind tibiae medially shaded (Fig. 37A). Pigmented ventral eye facets with the 0-1-2 pattern. *Structure.* Head with the PO1 setae, the PO4 setae are about half the length of the OC3 setae, OC3 setae are usually in position 2A (Fig. 37B). Pronotum with 2 mAM (Fig. 37B). Metanotum without campaniform sensilla (Fig. 37C). Upper surface of the hind coxae with microtrichia. Abdominal tergite VIII posteromarginal comb complete, microtrichia short, less than 10 µm (Fig. 37D).

Interception frequency. Very common.

Region(s) of interceptions. Asia, Australia and the Pacific, Europe, North Africa and the Middle East, North America, Sub-Saharan Africa.

Comments. Karny (1910) proposed the name *Frankliniella* but lacked reference to a particular species. This oversight was later rectified by Hood (1914) who designated *F. intonsa* as the type-species for the genus.

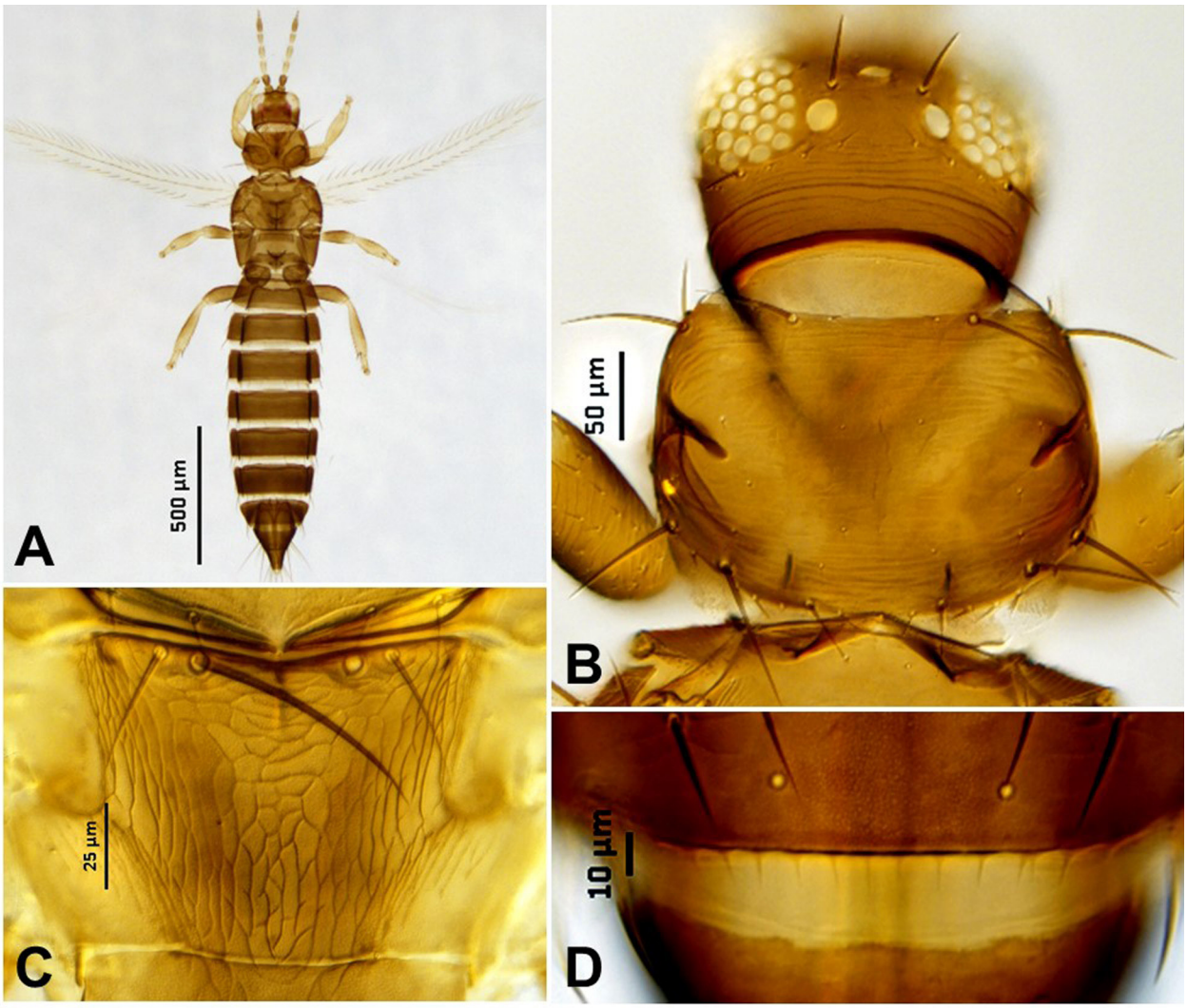

Figure 37. A–D) *Frankliniella intonsa*. **A)** Body. **B)** Head and pronotum. **C)** Metanotum. **D)** Abdominal tergite VIII posteromarginal comb.

Frankliniella invasor Sakimura (Fig. 38)

Diagnosis. The thinner apical dorsal setae of the antennal segment II (Fig. 38B) and saucer-shaped pedicel of antennal segment III (Fig. 38C) distinguishes this species from the similar *F. funderburki*.

Distinguishing features. *Color.* Body, forewings, legs pale. Abdominal tergites often with darker anteromedial shading and/or small dark anteroangular blotches (Fig. 38A). Pigmented ventral eye facets with the 0-1-2 pattern. *Structure.* Antennal segment II dorsal apical setae similar in thickness to the same setae on segments III–V (Fig. 38B). Antennal segment III with a basal oval collar surmounted by narrow disc with acute lateral angles, pedicel saucer-shaped with acute lateral angles (Fig. 38C). Head with the PO1 setae, OC3 setae in position 2B (Fig. 38D). Pronotum usually with 4 mAM setae (Fig. 38D). Upper surface of the hind coxae with microtrichia. Abdominal tergite VIII posteromarginal comb complete.

Interception frequency. Uncommon.

Region(s) of interceptions. North America, Central America and the Caribbean.

Comments. Described from specimens collected in Hawaii and Puerto Rico *F. invasor* is speculated to have originated from the Caribbean-Central American region (Sakimura 1972).

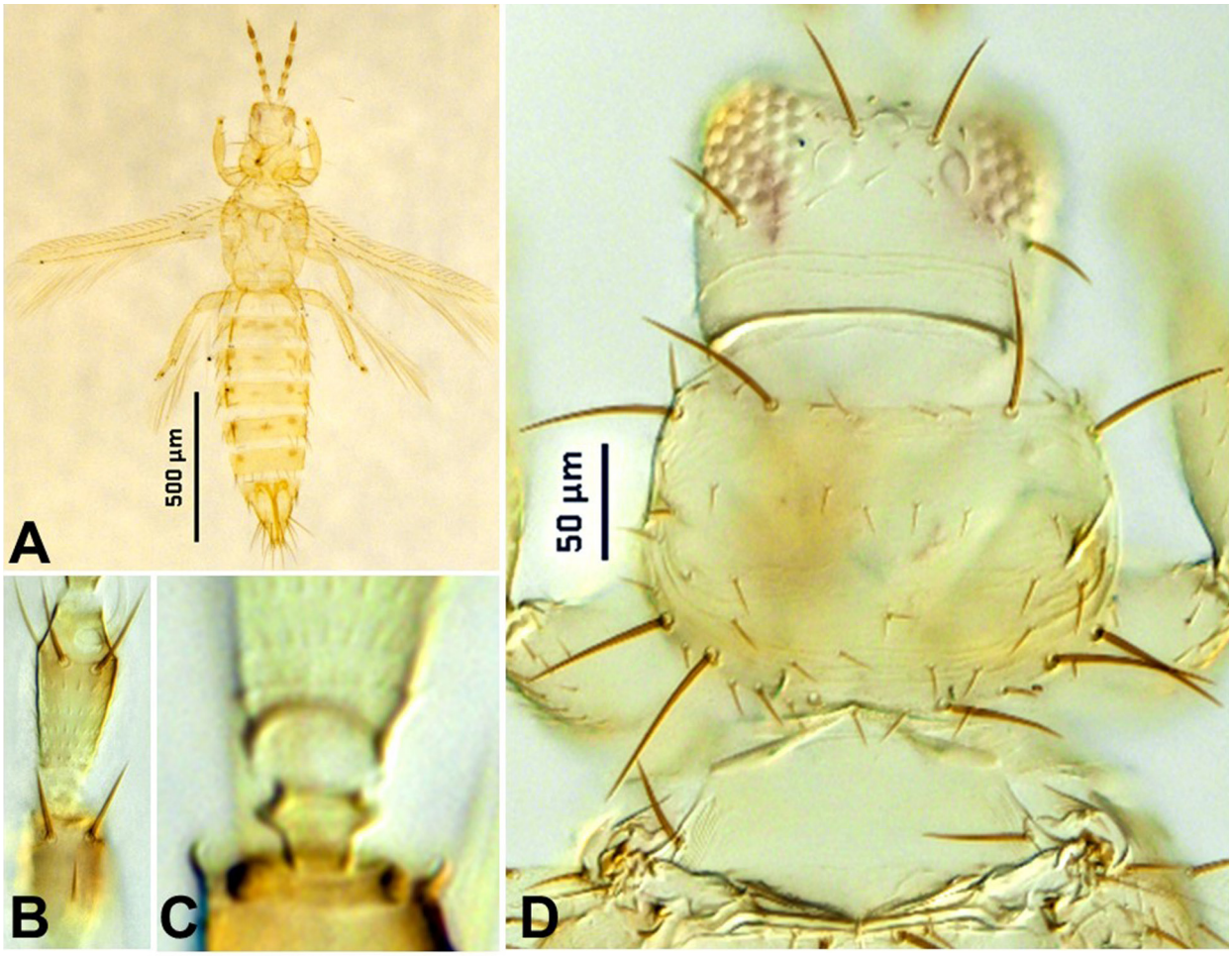

Figure 38. A–D) *Frankliniella invasor*. **A)** Body. **B)** Antennal segments II and III. **C)** Pedicel and basal collar of antennal segment III. **D)** Head, pronotum and mesonotum.

Frankliniella kelliae Sakimura (Fig. 39)

Diagnosis. This pale species is similar to *Frankliniella difficilis** Hood. The females of the congeners are indistinguishable. However, in male specimens, a complete abdominal tergite VIII posteromarginal comb on *F. kelliae* and absence of the comb on *F. difficilis** separates the two congeners (Sakimura 1981).

Distinguishing features. *Color.* Body, forewings, legs pale. Abdominal tergites often with small dark anteroangular blotches (Fig. 39A). Pigmented ventral eye facets with the 0-1-2 pattern. *Structure.* Antennal segment III pedicel mushroom-shaped, lateral angles blunt (Fig. 39B). Head with the PO1 setae, OC3 setae in position 2A (Fig. 39C). Pronotum usually with 4 mAM setae (Fig. 39C). Upper surface of the hind coxae with microtrichia. Abdominal tergite VIII posteromarginal comb complete (Fig. 39D).

Interception frequency. Rare.

Region(s) of interceptions. North America, Central America and the Caribbean.

Comments. The type series of *F. difficilis** specimens were described from Guadeloupe and Martinique (Hood 1925). Interestingly a thrips faunal survey of Guadeloupe and Martinique by Etienne et al. (2015) recorded collection of *F. kelliae* but no subsequent collection of the similar *F. difficilis**.

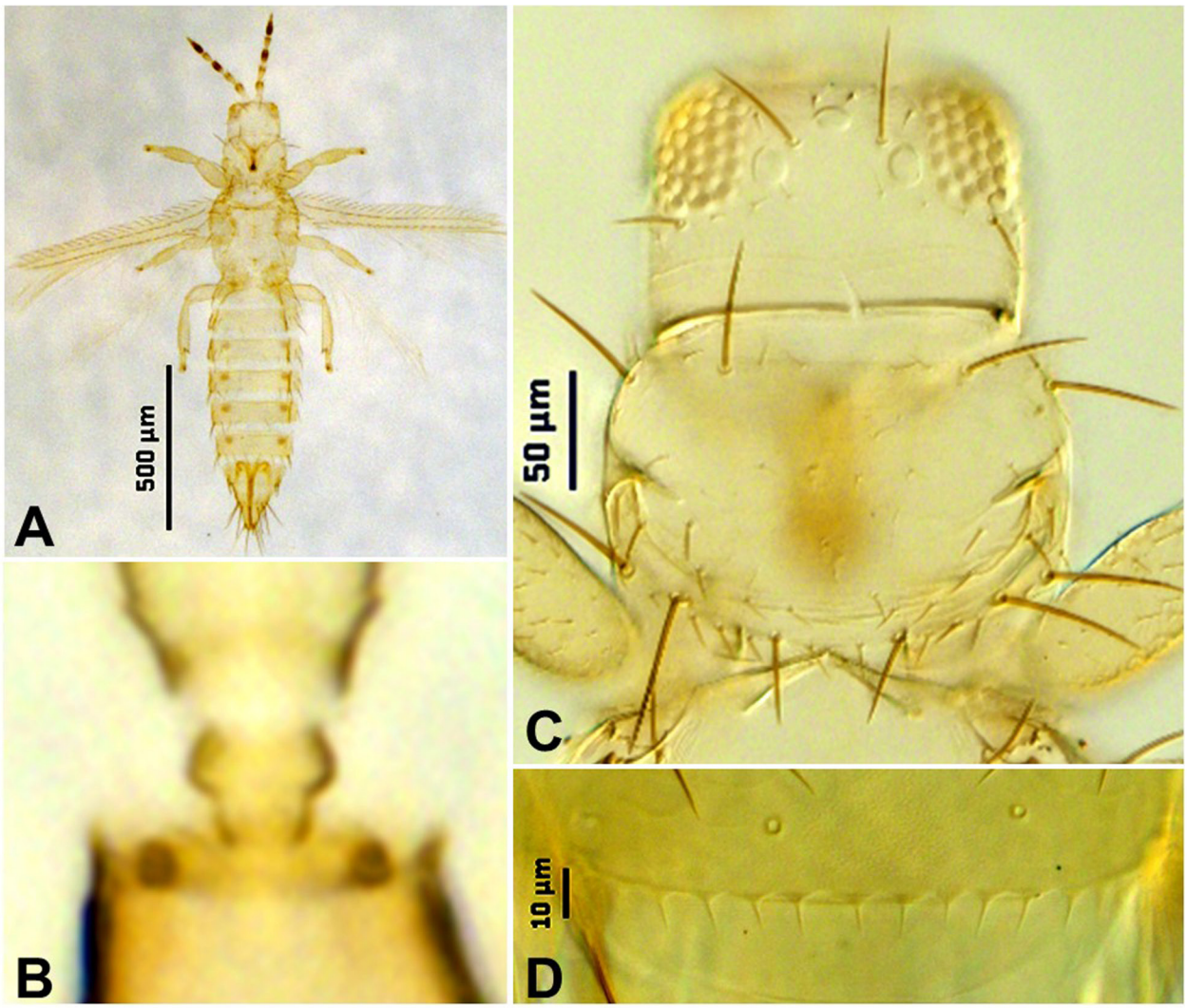

Figure 39. A–D) *Frankliniella kelliae*. **A)** Body. **B)** Pedicel of antennal segment III. **C)** Head and pronotum. **D)** Abdominal tergite VIII posteromarginal comb.

Frankliniella longipennis Moulton (Fig. 40)

Distinguishing features. *Color.* Body dark, forewings dark, basally pale, legs with all femora dark, foretibiae pale, mid and hind tibiae dark. (Fig. 40A). Ventral pigmented facets with the 0-0-2 pattern. *Structure.* Head distinctly narrower than the pronotum (Fig. 40A). Compound eyes with 3–5 enlarged anterolateral facets (Fig. 40B). The PO1 setae are usually present and the OC3 setae are in position 2B (Fig. 40C). Pronotum usually with 2 mAM setae (Fig. 40C). Abdominal tergite I mediallywithout discal lines of sculpture (Fig. 40D). Upper surface of the hind coxae without microtrichia. Abdominal tergite VIII posteromarginal comb complete.

Interception frequency. Rare.

Region(s) of interceptions. South America.

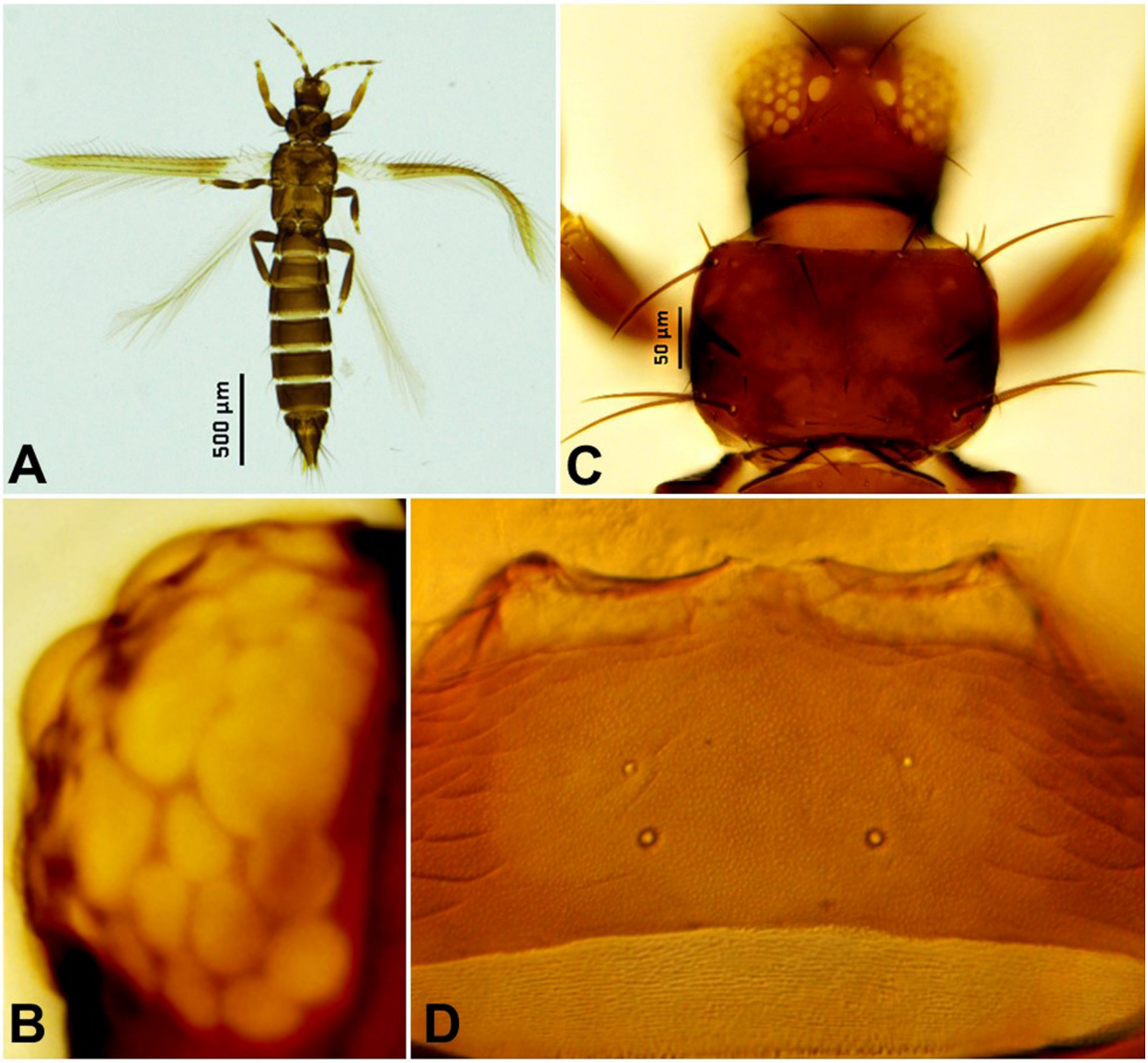

Figure 40. A–D) *Frankliniella longipennis* **A)** Body. **B)** Ventral eye. **C)** Head and pronotum. **D)** Abdominal tergite I.

Frankliniella minuta (Moulton) (Fig. 1E, 41)

Diagnosis. A member of the minuta series group which have short OC3 setae and rather compact antennal segments. This species is unique amongst the congeners examined here by having more than five anteromarginal setae on the forewing clavus.

Distinguishing features. *Color.* Body dark, forewings dark, legs dark, only foretibiae pale. (Fig. 41A). Eyes with many ventral pigmented facets. *Structure.* Head without the PO1 setae, OC3 setae in position 2A (Fig. 41B). Pronotum with 2 mAM setae (Fig. 41B). Forewing clavus with 6–8 anteromarginal setae (Fig. 1E). Metanotum without sensilla. Upper surface of the hind coxae with microtrichia. Abdominal tergite VIII posteromarginal comb complete (Fig. 41C). Abdominal tergite IX B1 setae about the same length as tergite X (Fig. 1C).

Interception frequency. Uncommon.

Region(s) of interceptions. North America, Central America and the Caribbean, South America.

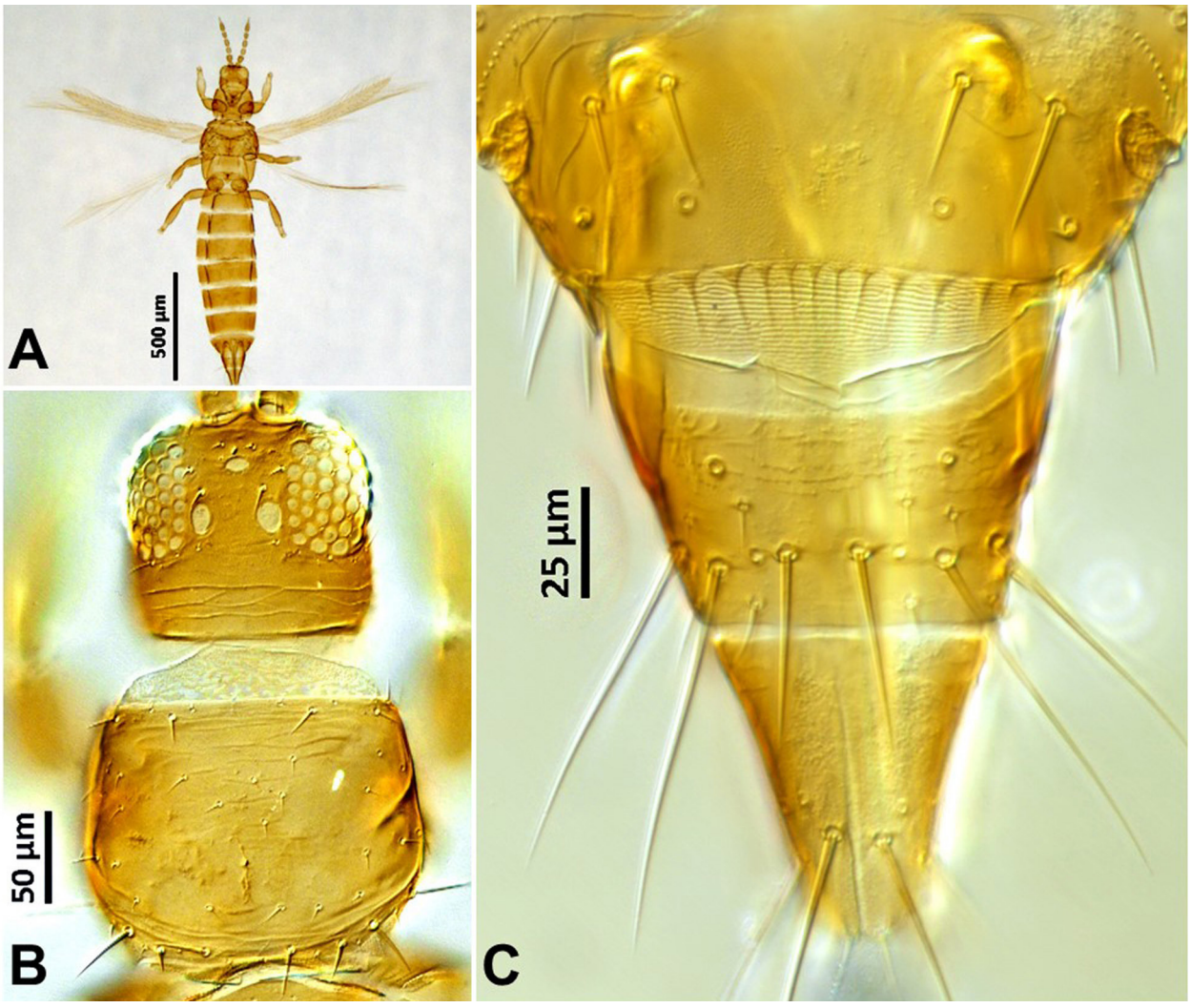

Figure 41. A–C) *Frankliniella minuta*. **A)** Body. **B)** Head and pronotum. **C)** Abdominal tergites VIII–X.

Frankliniella musaeperda Hood (Fig. 42)

Distinguishing features. *Color.* Body, forewings, legs pale (Fig. 42A). *Structure.* Antennal segment III basal collar indistinct, pedicel saucer-shaped with acute lateral angles (Fig. 42B). Head with the PO1 setae, OC3 setae in position 2B (Fig. 42C). Pronotum usually with 2 mAM (Fig. 42C). Upper surface of the hind coxae with microtrichia. Abdominal tergite VIII posteromarginal comb complete, microtrichia 12–15 µm (Fig. 42D).

Interception frequency. Rare.

Region(s) of interceptions. Central America and the Caribbean.

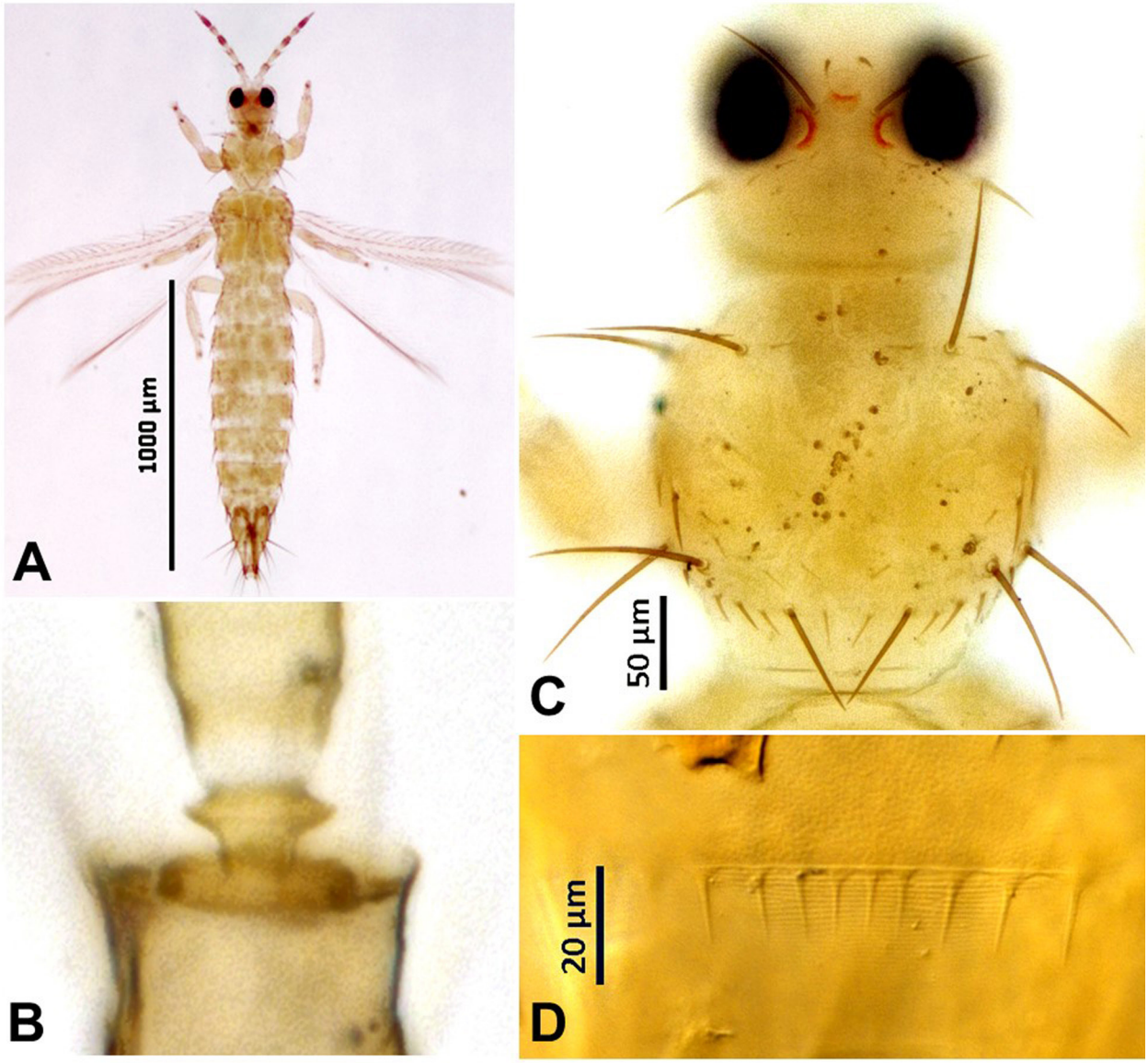

Figure 42. A–D) *Frankliniella musaeperda*, holotype, USNM 74440. **A)** Body. **B)** Antennal segment III pedicel. **C)** Head and pronotum. **D)** Abdominal tergite VIII posteromarginal comb.

Frankliniella occidentalis (Pergande) (Fig. 43)

Diagnosis. This species can be variably shaded from pale to dark. Dark specimens can be confused with *F. panamensis* but differ from the latter by having eyes with many ventral pigmented facets, a shorter abdominal tergite VIII posteromarginal comb and usually lack microtrichia on the upper surface of the hind coxae.

Distinguishing features. *Color.* Body, intermediate/pale (most common) (Fig. 43A) or dark (Fig. 43B), forewings pale, legs indistinctly shaded or pale (Fig. 43A, 43B). Eyes with many ventral pigmented facets, the darker facets in the 1-1-2 pattern with a longitudinal row of 3 paler pigmented facets that extend from between the inner and medial darker facets to the anterior outer margin (Fig. 43C). *Structure.* Head with the PO1 setae, OC3 setae in position 2B (Fig. 43D). Pronotum with 2–4 mAM (Fig. 43D). Upper surface of the hind coxae usually without microtrichia. Abdominal tergite VIII posteromarginal comb complete, microtrichia length about the same as the distance between 2 microtrichia.

Interception frequency. Very common.

Region(s) of interceptions. Asia, Australia and the Pacific, Central America and the Caribbean, Europe, North Africa and the Middle East, North America, South America, Sub-Saharan Africa.

Comments. This species, commonly known as the western flower thrips (WFT) was the most frequently intercepted *Frankliniella* at US ports of entry from 1985 until 2021. Molecular evidence by Rugman-Jones et al. (2010) suggested *F. occidentalis* consists of two sympatric, morphologically identical species. The authors designated the two molecularly divergent groups as WFT lupin (WFTL) and WFT greenhouse (WFTG). More recently Gunawardana et al. (2017) reported that some *Frankliniella* have microtrichia on the upper surface of the hind coxae. I subsequently examined some of the Rugman-Jones et al. (2010) DNA voucher specimens and discovered that from the provided female specimens those with the molecular haplotypes L and R from the WFTL group, Rugman-Jones et al. (2010), possess microtrichia on the upper hind coxae. Additionally, these specimens vary in shading, from pale to dark, and the B1 setae on abdominal tergite IX are less than 100 μm.

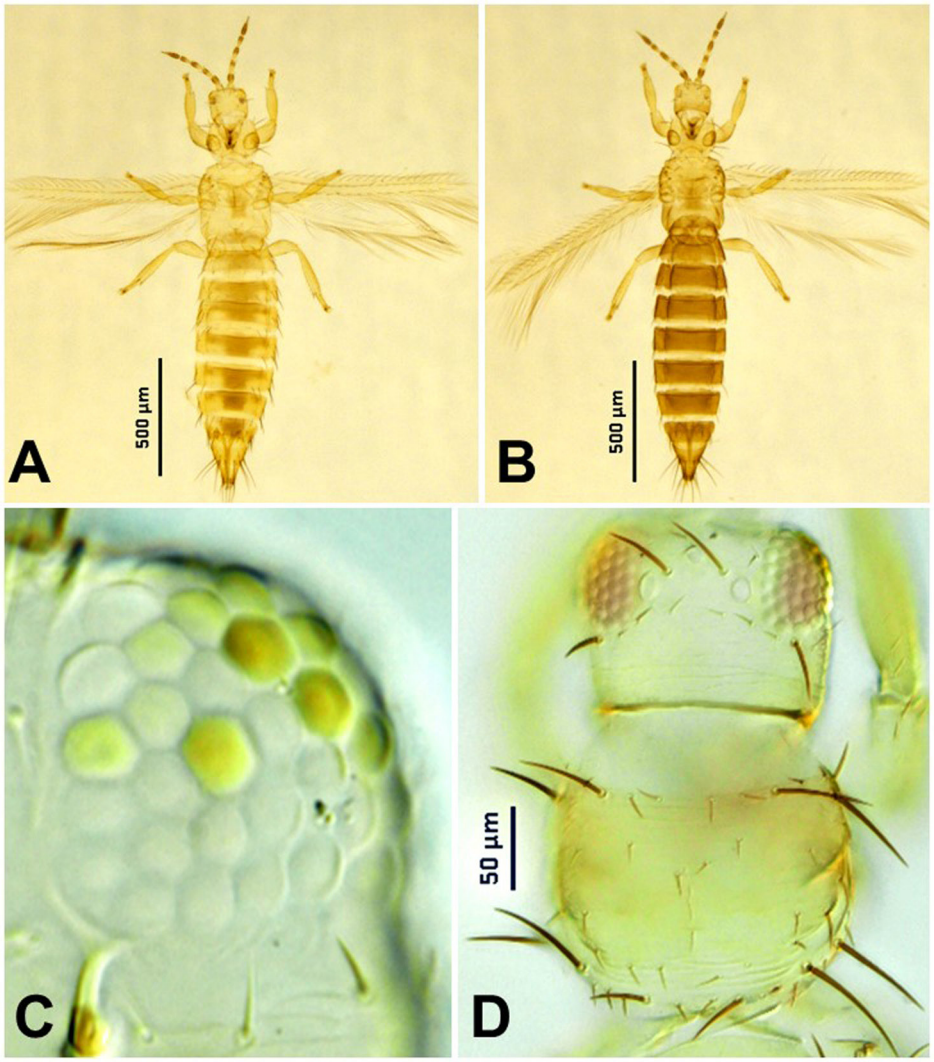

Figure 43. A–D) *Frankliniella occidentalis*. **A)** Intermediate pale form. **B)** Dark form. **C)** Ventral compound eye. **D)** Head and pronotum.

Frankliniella panamensis Hood (Fig. 44)

Distinguishing features. *Color.* Body dark, forewings pale or lightly shaded, femora dark, apically paler, tibiae variable shaded medially (Fig. 44A). The head of fresh adult female specimens usually is bicolored with the anterior half being paler (Fig. 44B). Pigmented ventral eye facets with 1-1-2 pattern. *Structure.* Head with PO1 setae, OC3 setae in position 2B (Fig. 44C). Pronotum with 4 mAM (Fig. 44C). Upper surface of the hind coxae with microtrichia. Abdominal tergite VIII posteromarginal comb complete, microtrichia 17–22 µm.

Interception frequency. Very common.

Region(s) of interceptions. South America.

Comments. Following the logic of what should be considered a host plant by Mound (2013), the flower genera *Alstroemeria*, *Rosa*, and *Solidago* were documented hosts for *F. panamensis* (Gunawardana et al. 2017)

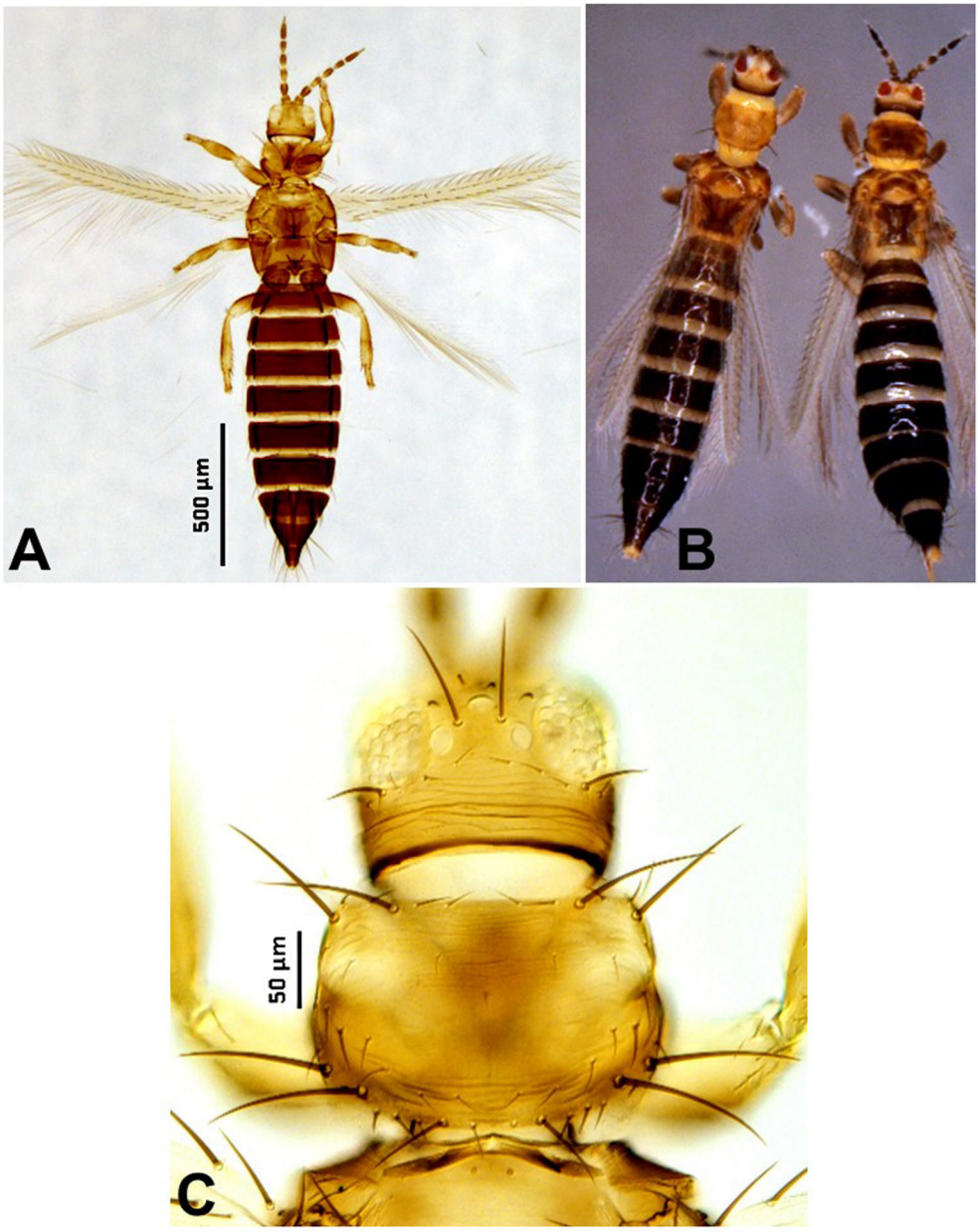

Figure 44. A–C) *Frankliniella panamensis*. **A)** Slide mounted adult female. **B)** Fresh specimens in alcohol. **C)** Head and pronotum.

Frankliniella parvula Hood (Fig. 45)

Diagnosis. The elongate pedicel separates this species from the similar *F. brevicaulis* and *F. zeteki**.

Distinguishing features. *Color.* Body dark, forewings dark, basally paler, femora shaded, tibiae paler (Fig. 45A). Eyes without ventral pigmented facets (Fig. 45C). *Structure.* Antennal segment III pedicel distally elongate (Fig. 45B). Head with the PO1 setae, OC3 setae in position 2B (Fig. 45D). Pronotum usually with 2 mAM setae (Fig. 45D). Upper surface of the hind coxae with microtrichia. Abdominal tergite VIII posteromarginal comb complete, microtrichia 9–12 µm.

Interception frequency. Uncommon.

Region(s) of interceptions. North America, Central America and the Caribbean, South America.

Comments. Usually intercepted from banana flowers.

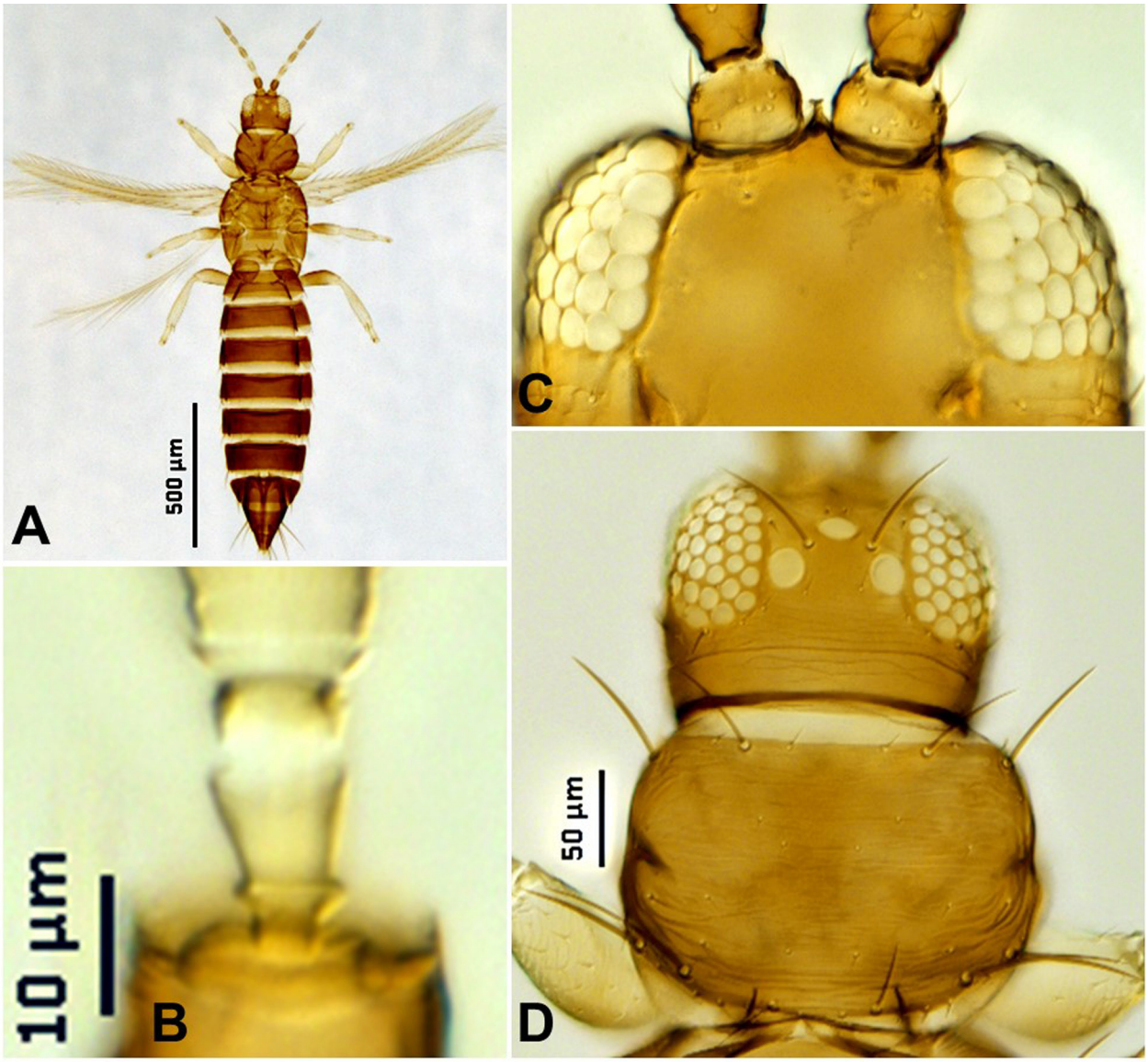

Figure 45. A–D) *Frankliniella parvula* **A)** Body. **B)** Pedicel of antennal segment III. **C)** Ventral compound eyes. **D)** Head and pronotum.

Frankliniella pelucensis Skarlinsky and Rugman-Jones (Fig. 46)

Diagnosis. This species is readily separated from most dark body congeners because of its pale antennal segment II. The only other dark body congener known to the author with a pale antennal segment II is *Frankliniella regalis** Hood.

Distinguishing features. *Color*. Body dark, forewings dark, basally pale, femora dark, foretibiae lightly shaded, mid and hind tibiae dark, paler at the tibia/femur junction (Fig. 46A). Pigmented ventral eye facets with the 1-2-2 pattern. *Structure*. Head with the PO1 setae, OC3 setae in position 2B (Fig. 46B). Pronotum with 2–4 mAM setae (Fig. 46B). Upper surface of the hind coxae with microtrichia. Abdominal tergite VIII posteromarginal comb complete, microtrichia 11–15 µm (Fig. 46C).

Interception frequency. Rare.

Region(s) of interceptions. Central America and the Caribbean.

Comments. Intercepted from blackberries.

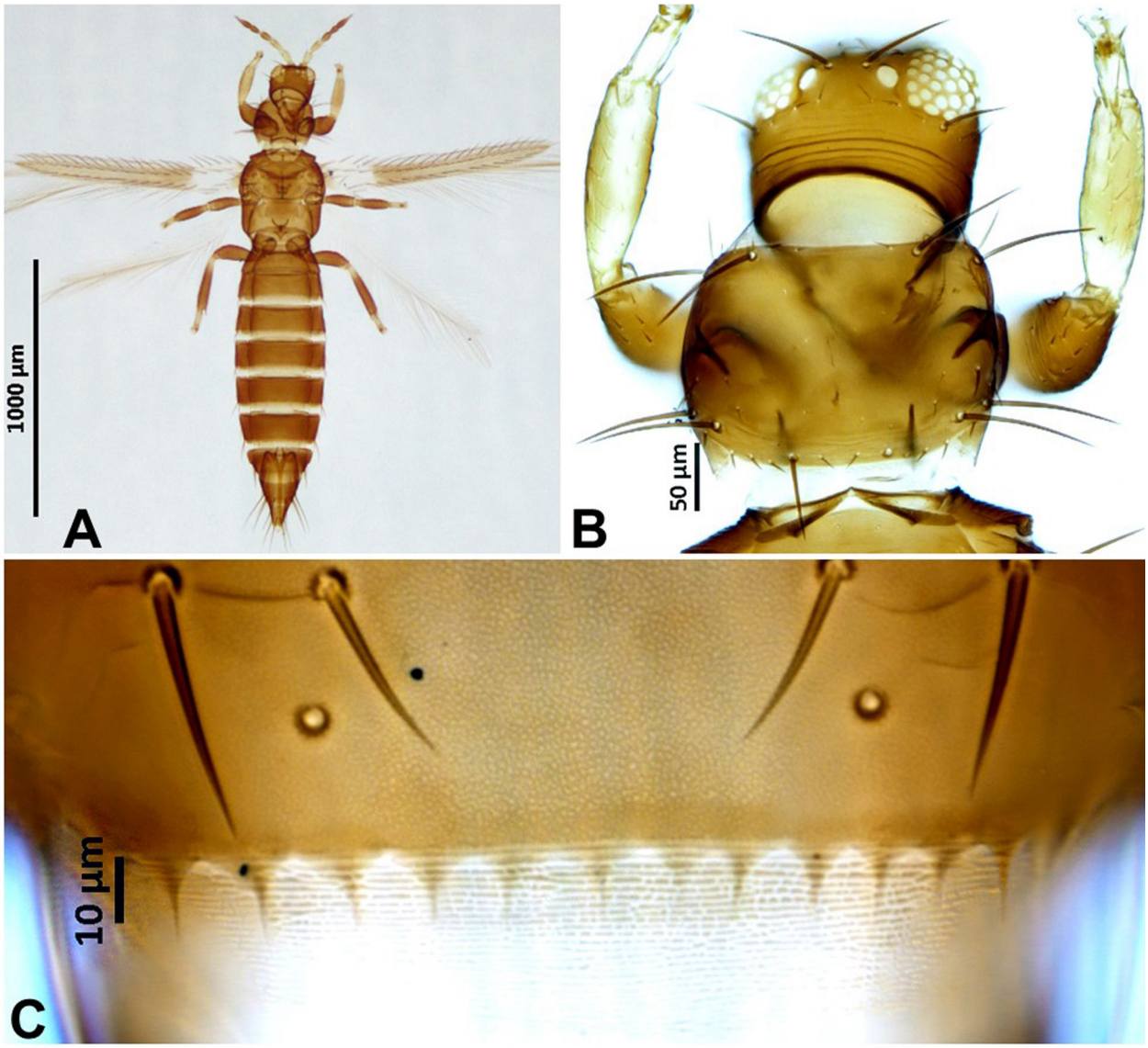

Figure 46. A–C) *Frankliniella pelucensis*, holotype, USNM 01207643. **A)** Body. **B)** Head and pronotum. **C)** Abdominal tergite VIII posteromarginal comb.

Frankliniella regia Hood (Fig. 47)

Diagnosis. This species is similar to *Frankliniella regina** Hood and *Frankliniella regentis** Berzosa. In common, all have 4 to 6 small subapical dorsal setae on the antennal segment VI. *Frankliniella regia* and *F. regina* lack discal lines of sculpture on abdominal tergite I, whereas *F. regentis* has discal lines of sculpture on the tergite. *Frankliniella regia* has ventral pigmented eye facets and *F. regina* does not.

Distinguishing features. *Color.* Body dark, forewings dark, basally pale, legs dark, fore tibiae pale, hind tibiae basally pale (Fig. 47A). Pigmented ventral eye facets in the 0-1-2 pattern and occasionally the 1-1-2 pattern, with the inner facet distinctly paler than the medial and outer facets. *Structure.* Antennal segment VI with 4 to 6 small subapical dorsal setae, often arranged in a diamond pattern (Fig. 47B). Head with the PO1 setae, OC3 setae in position 2B (Fig. 47C). Pronotum with 2 mAM setae (Fig. 47C). Upper surface of the hind coxae with microtrichia. Abdominal tergite I without discal lines of sculpture between the campaniform sensilla (Fig. 47D). Abdominal tergite VIII posteromarginal comb complete, microtrichia 23–28 µm.

Interception frequency. Uncommon.

Region(s) of interceptions. South America.

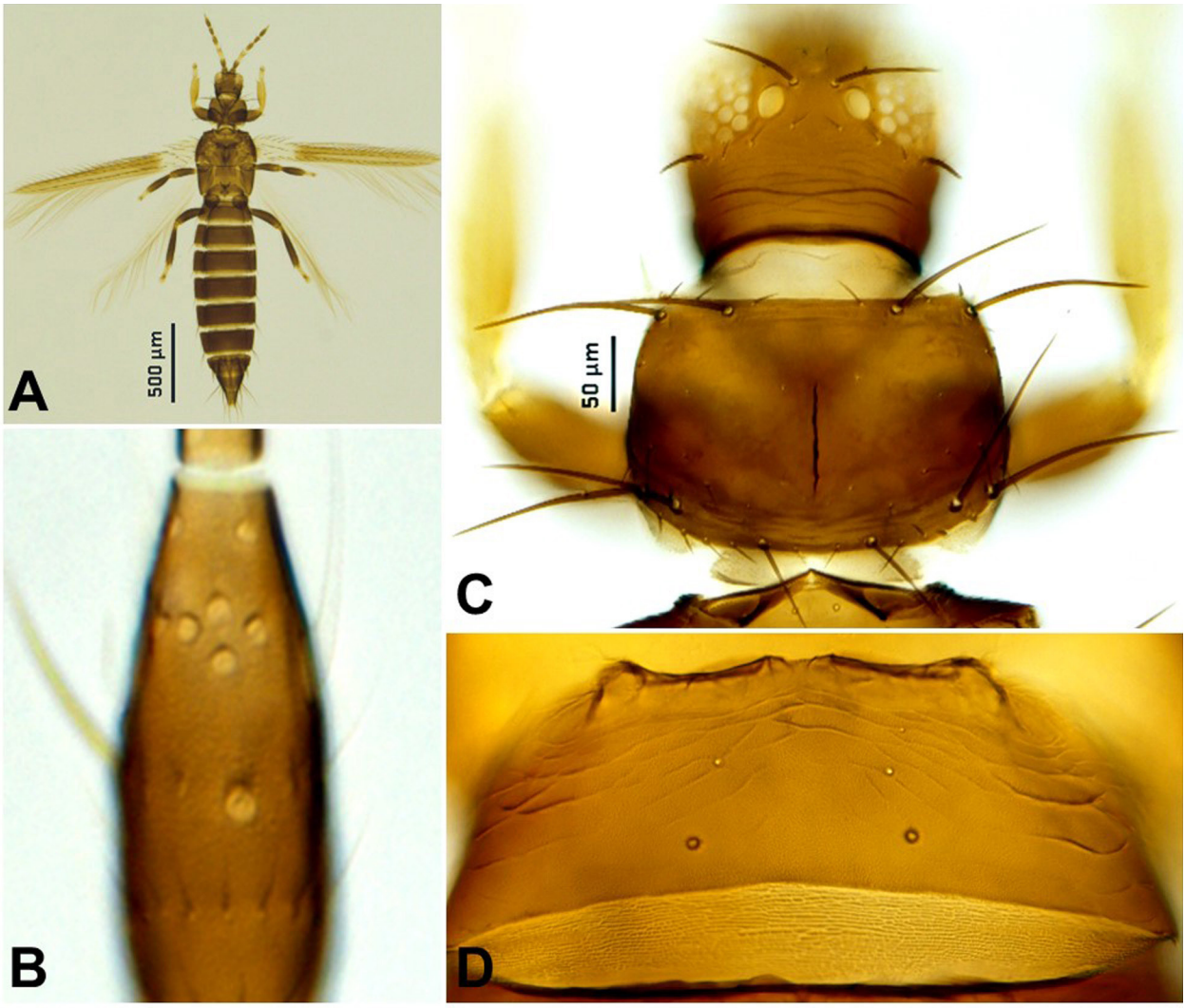

Figure 47. A–D) *Frankliniella regia*. **A)** Body. **B)** Antennal segment VI. **C)** Head and pronotum. **D)** Abdominal tergite I.

Frankliniella sanabriana Skarlinsky and Rugman-Jones (Fig. 48)

Diagnosis. This species is similar to *F. gardeniae* and *F. inca*. The subtle difference in the shape of the antennal segment III pedicel distinguishes it from the latter two species. The lateral margins on the distal half of the pedicel of *F. sanabriana* sharply converges apically whereas the apical sides of the pedicel on *F. gardeniae* and *F. inca* are nearly parallel.

Distinguishing features. *Color.* Body, wings and legs pale (Fig. 48A). Pigmented ventral eye facets with the 0-1-2 pattern. *Structure.* Antennal segment II approximately 1.7 times longer than wide, segment III pedicel chalice-shaped with tapered lateral angles and the basal collar outline is indistinct (Fig. 48B). Head with the PO1, OC3 setae in position 2B (Fig. 48C). Pronotum with 2 mAM setae (Fig. 48C). Upper surface of the hind coxae with microtrichia. Abdominal tergite VIII posteromarginal comb complete, microtrichia 14–19 µm (Fig. 48D).

Interception frequency. Rare.

Region(s) of interceptions. Central America and the Caribbean.

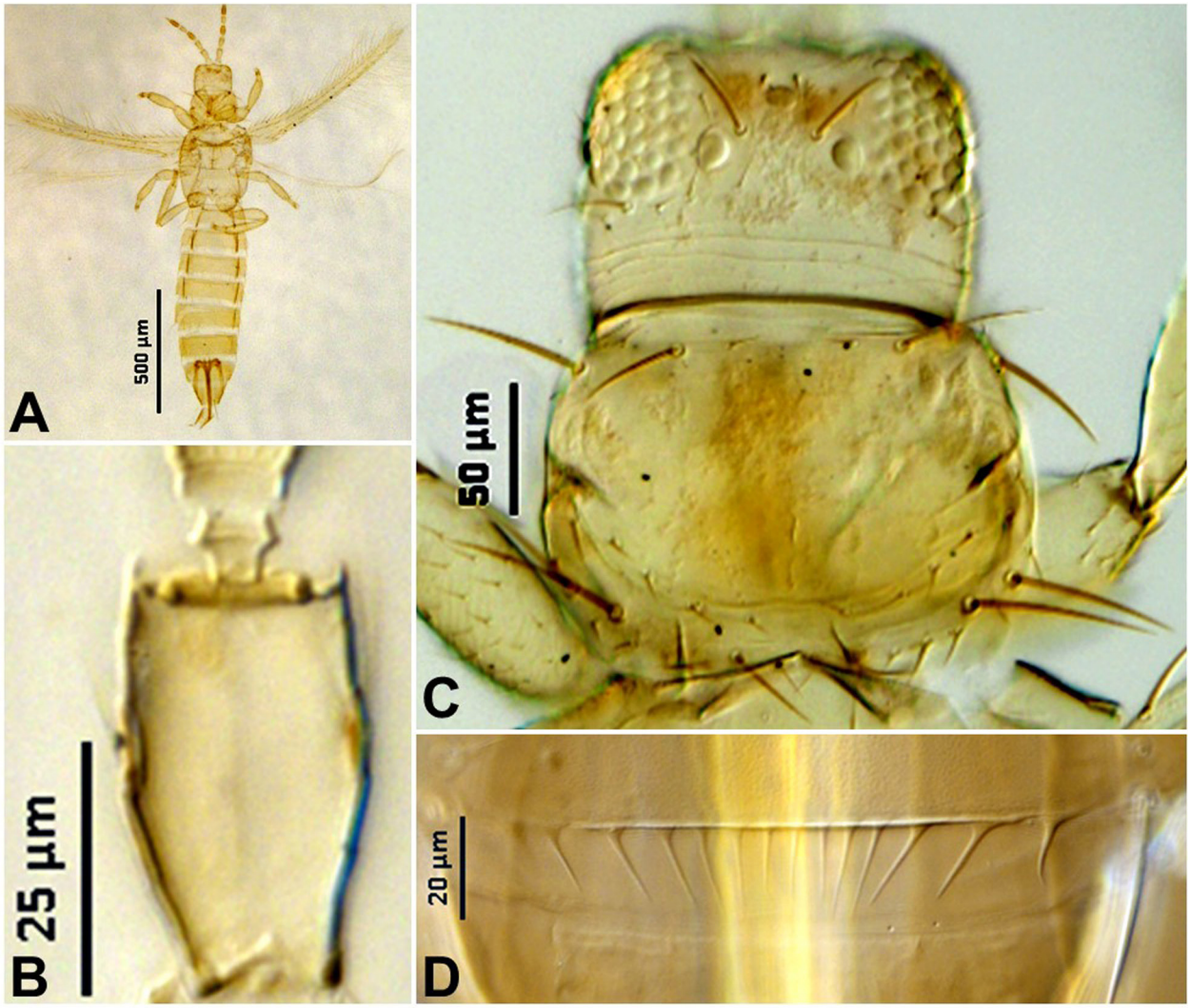

Figure 48. A–D) *Frankliniella sanabriana*, holotype, USNM 01207647. **A)** Body. **B)** Antennal segment II and pedicel of antennal segment III. **C)** Head and pronotum. **D)** Abdominal tergite VIII posteromarginal comb.

Frankliniella schultzei (Trybom) (Fig. 49)

Distinguishing features. *Color.* Body dark or pale, forewings shaded or pale, legs lightly shaded brown (Fig. 49A) or pale (Fig. 49B). Pigmented ventral eye facets with the 1-2-2 pattern. *Structure.* Antennal segment VI sense cone with its base wider than segment VII (Fig. 49C). Head with the PO1 setae, OC3 setae positions variable, either 3 (Fig. 49D) or 4 (Fig. 49E). Pronotum with 2 mAM setae. Metanotum without campaniform sensilla. Upper surface of the hind coxae with microtrichia. Abdominal tergite VIII posteromarginal comb incomplete.

Interception frequency. Common.

Region(s) of interceptions. Asia, Australia and the Pacific, Central America and the Caribbean, Europe, North Africa and the Middle East, North America, South America, Sub-Saharan Africa.

Comments. Current taxonomy recognizes a pale and dark form of this species (ThripsWiki 2023). In contrast, molecular, morphometric, and cross mating evidence suggested the color forms may represent reproductively isolated sympatric species (Gikonyo et al. 2017, Hereward et al. 2017, Tyagi et al. 2017).

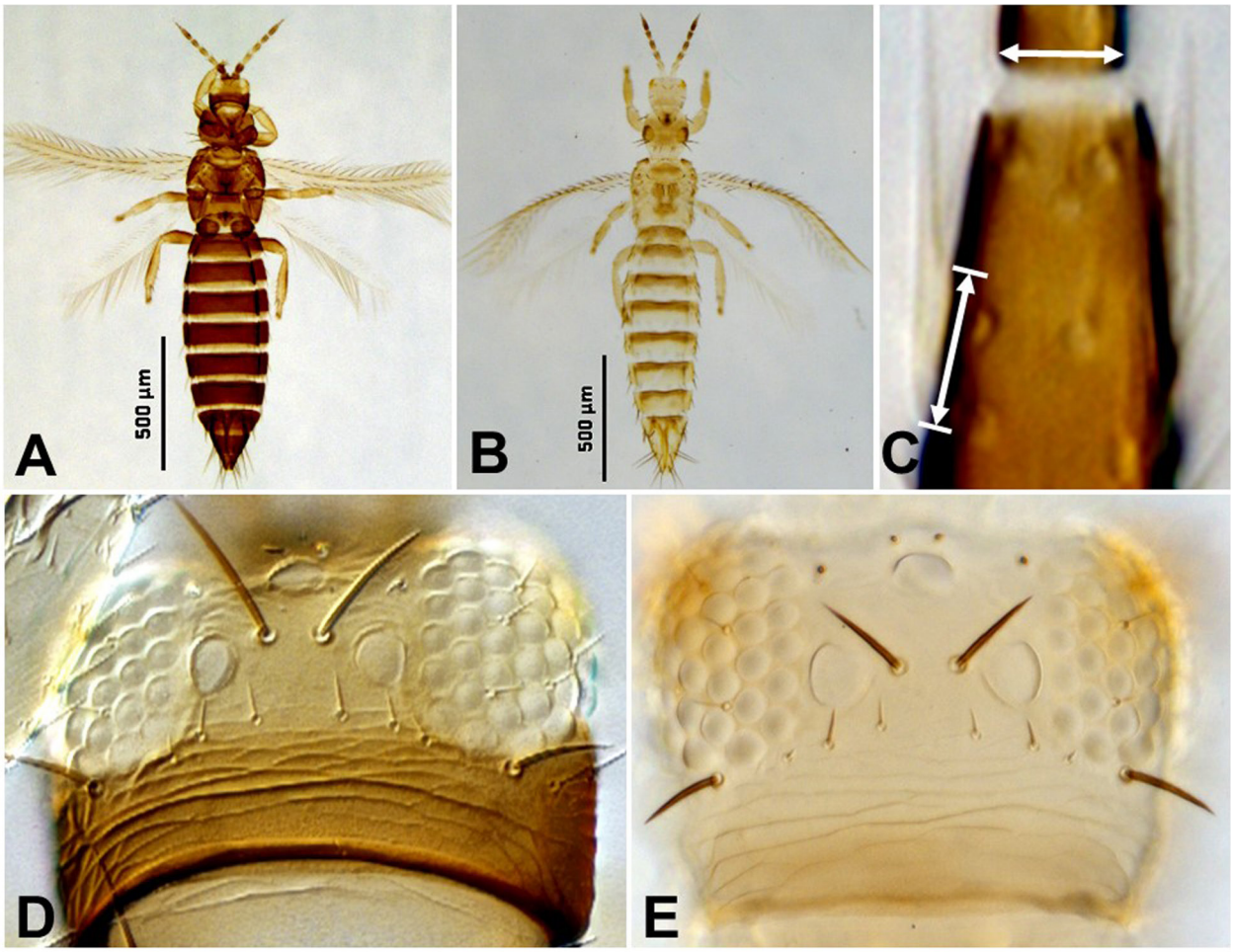

Figure 49. A–E) *Frankliniella schultzei* **A)** Dark form. **B)** Pale form. **C)** Antennal segment VI subapical sense cones and basal portion of segment VII. The double headed arrows indicate areas of measure. **D)** Head of the dark form. **E)** Head of the pale form.

Frankliniella simplex Priesner

Diagnosis. The shorter B1 setae on abdominal tergite VI distinguishes this dark species from the similar *F. fallaciosa*.

Distinguishing features. *Color.* Body dark, forewings dark, femora dark, foretibiae paler, mid and hind tibiae dark. *Structure.* Antennal segment III pedicel simple. Head with the PO1 setae, OC3 setae in position 2B. Pronotum usually with 2 mAM. Metanotum with campaniform sensilla. Abdominal tergite VIII posteromarginal comb of microtrichia complete, tergite IX B1 setae about the same length as tergite X.

Interception frequency. Uncommon.

Region(s) of interceptions. North America, Central America and the Caribbean.

Frankliniella suramericana Skarlinsky and Rugman-Jones (Fig. 50)

Diagnosis. This pale species is similar to *F. gemina* and *F. gossypiana*. The presence or absence of microtrichia on the upper hind coxae and discal setae on the abdominal sternite II separates these similar congeners.

Distinguishing features. *Color*. Body, wings, and legs pale (Fig. 50A). Pigmented ventral eye facets with the 1-1-2 pattern. *Structure.* Antennal segment III pedicel simple. Head with the PO1 setae, OC3 setae in position 2B (Fig. 50B). Pronotum with 4mAM setae (Fig. 50B). Upper surface of the hind coxae with microtrichia (Fig. 50C). Abdominal sternite II with one or more discal setae (Fig. 50D). Abdominal tergite VIII posteromarginal comb complete (Fig. 51E).

Interception frequency. Uncommon.

Region(s) of interceptions. South America.

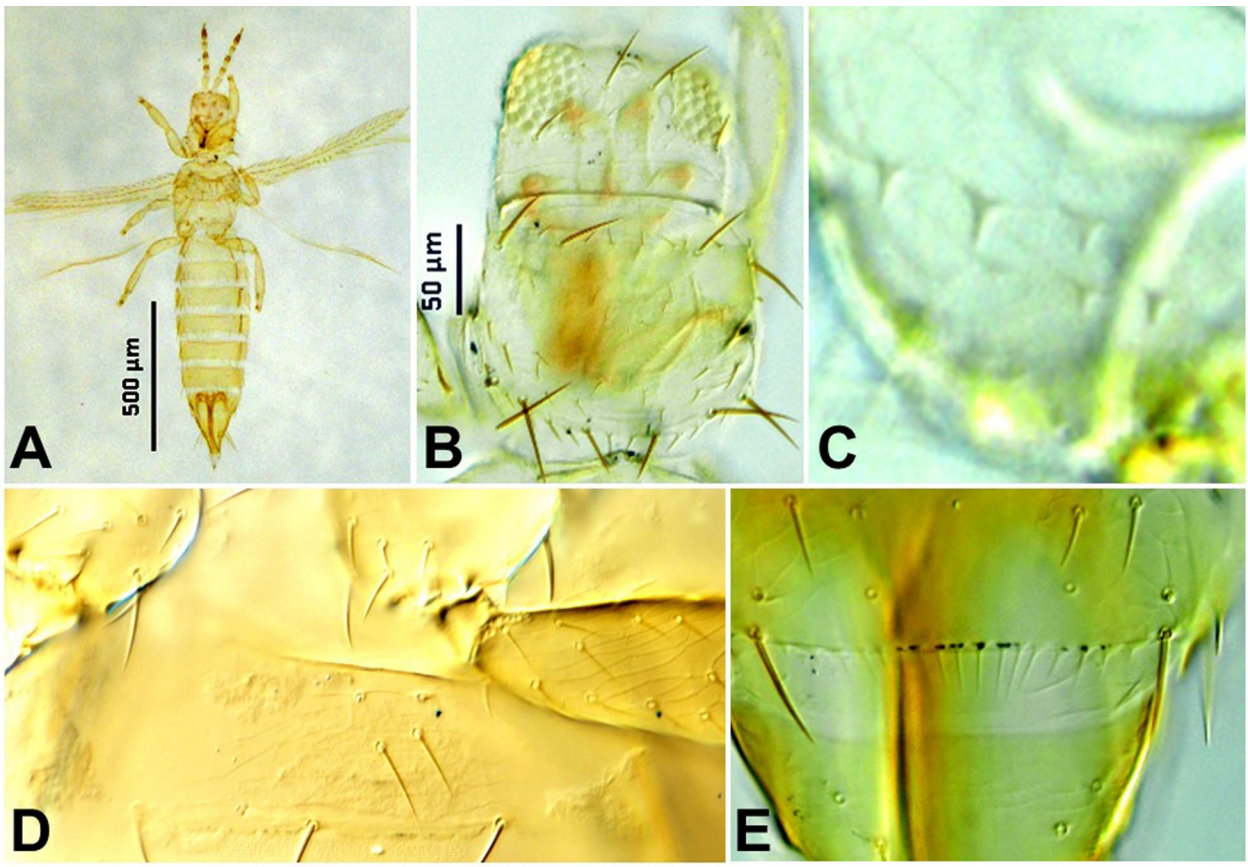

Figure 50. A–E. *Frankliniella suramericana*, holotype, USNM 01207739. **A)** Body. **B)** Head and pronotum. **C)** Upper surface of a hind coxa. **D)** Abdominal sternite II. **E)** Abdominal tergite VIII posteromarginal comb.

Frankliniella tenuicornis (Uzel) (Fig. 51)

Distinguishing features. *Color.* Body dark, forewings pale, femora dark, distally paler, tibiae paler (Fig. 51A). *Structure.* The head protrudes beyond the anterior margin of the compound eyes (Fig. 51B). Head usually with the PO1 setae, OC3 setae in position 2A (Fig. 51B). Pronotum with 2 mAM setae (Fig. 51B). Metanotum without campaniform sensilla (Fig. 51C). Upper surface of the hind coxae without microtrichia. Abdominal tergite VIII posteromarginal comb incomplete. The triangular bases occasionally have short microtrichia at their apices (Fig. 51D).

Interception frequency. Common.

Region(s) of interceptions. Europe, North Africa and the Middle East.

Comments. Usually intercepted from iris flowers.

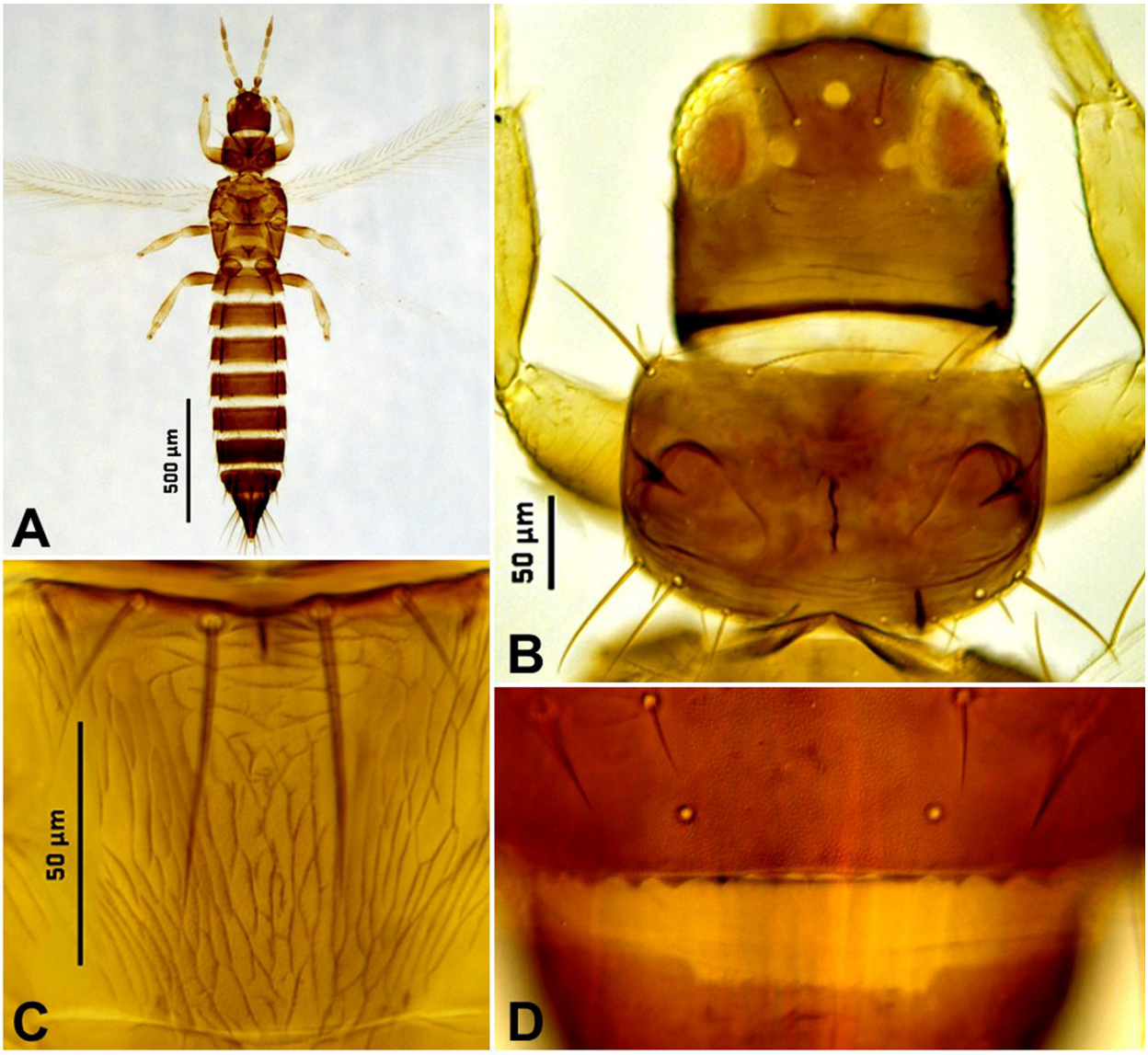

Figure 51. A–D) *Frankliniella tenuicornis* **A)** Body. **B)** Head and pronotum. **C)** Metanotum. **D)** Abdominal tergite VIII posteromarginal comb.

Frankliniella tritici (Fitch) (Fig. 52)

Diagnosis. Similar species with a mushroom-shaped antennal segment III pedicel and incomplete abdominal tergite VIII posteromarginal comb are, *Frankliniella insignis** Moulton, *Frankliniella ramirezi** Mound and Marullo, and *Frankliniella solidaginis** Hood. Differences between *F. tritici* and the other three congeners are few. The antennal segment VI of *F. insignis** and *F. solidaginis** is basally pale whereas the entire segment VI is dark on *F. tritici* and *F. ramirezi**. Specimens interpreted as *F. tritici* have the OC3 setae in position 2B, whereas on *F. ramirezi** these are in position 2A.

Distinguishing features. *Color.* Body pale or dark, forewings pale or shaded, legs pale or shaded (Fig. 52A). Pigmented ventral eye facets with the 1-1-2 pattern. *Structure.* Antennal segment III pedicel with lateral margins expanded mushroom shaped, basal collar outline indistinct (Fig. 52B). Head with the PO1 setae, OC3 setae in position 2B (Fig. 52C). Pronotum usually with 2 mAM setae (Fig. 52C). Upper surface of hind coxae without microtrichia. Abdominal tergite VIII posteromarginal comb incomplete (Fig. 52D).

Interception frequency. Common.

Region(s) of interceptions. North America.

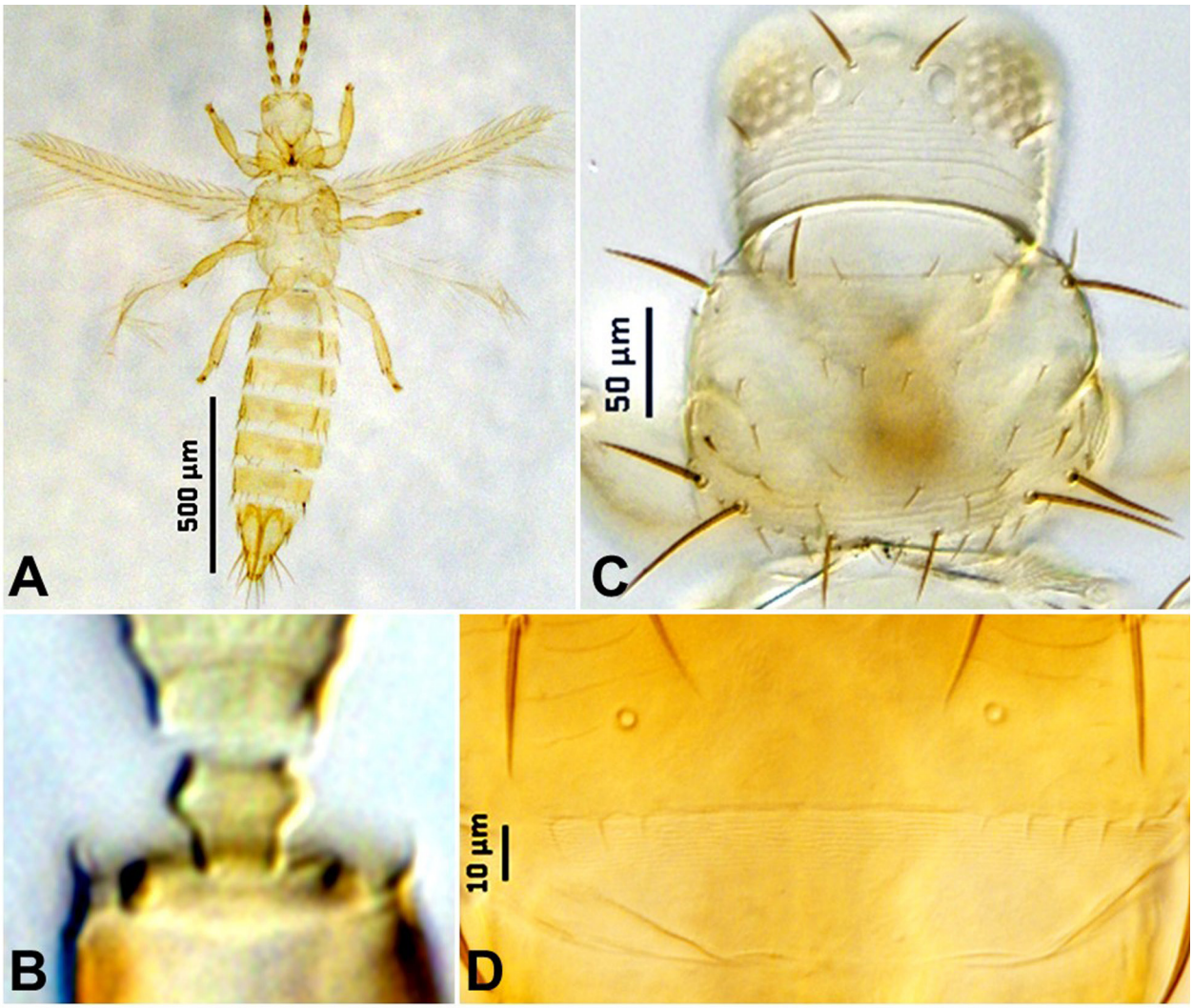

Figure 52. A–D) *Frankliniella tritici*. **A)** Body. **B)** Pedicel of antennal segment III. **C)** Head and pronotum. **D)** Abdominal tergite VIII posteromarginal comb.

Frankliniella tuberosi (Fig. 53)

Diagnosis. This dark species is similar to *Frankliniella phaeaner** Hood. The antennal segment VI of *F. tuberosi* has a transverse row of 2–3 small setae between the subapical sense cones. In contrast *F. phaeaner** has a cluster of 4 setae on large bases in a diamond pattern.

Distinguishing features. *Color.* Body dark, forewings dark, basally pale, legs dark with fore tibiae paler (Fig. 53A). Pigmented ventral eye facets with the 1-2-2 pattern. *Structure.* Head without the PO1 setae, OC3 setae in position 3 (Fig. 53B). Pronotum usually with 2 mAM (Fig. 53B). Upper surface of the hind coxae without microtrichia. Abdominal tergite I with discal lines of sculpture between the campaniform sensilla (Fig. 53C). Abdominal tergite VIII posteromarginal comb complete, microtrichia 15–20 µm (Fig. 53D).

Interception frequency. Rare.

Region(s) of interceptions. South America.

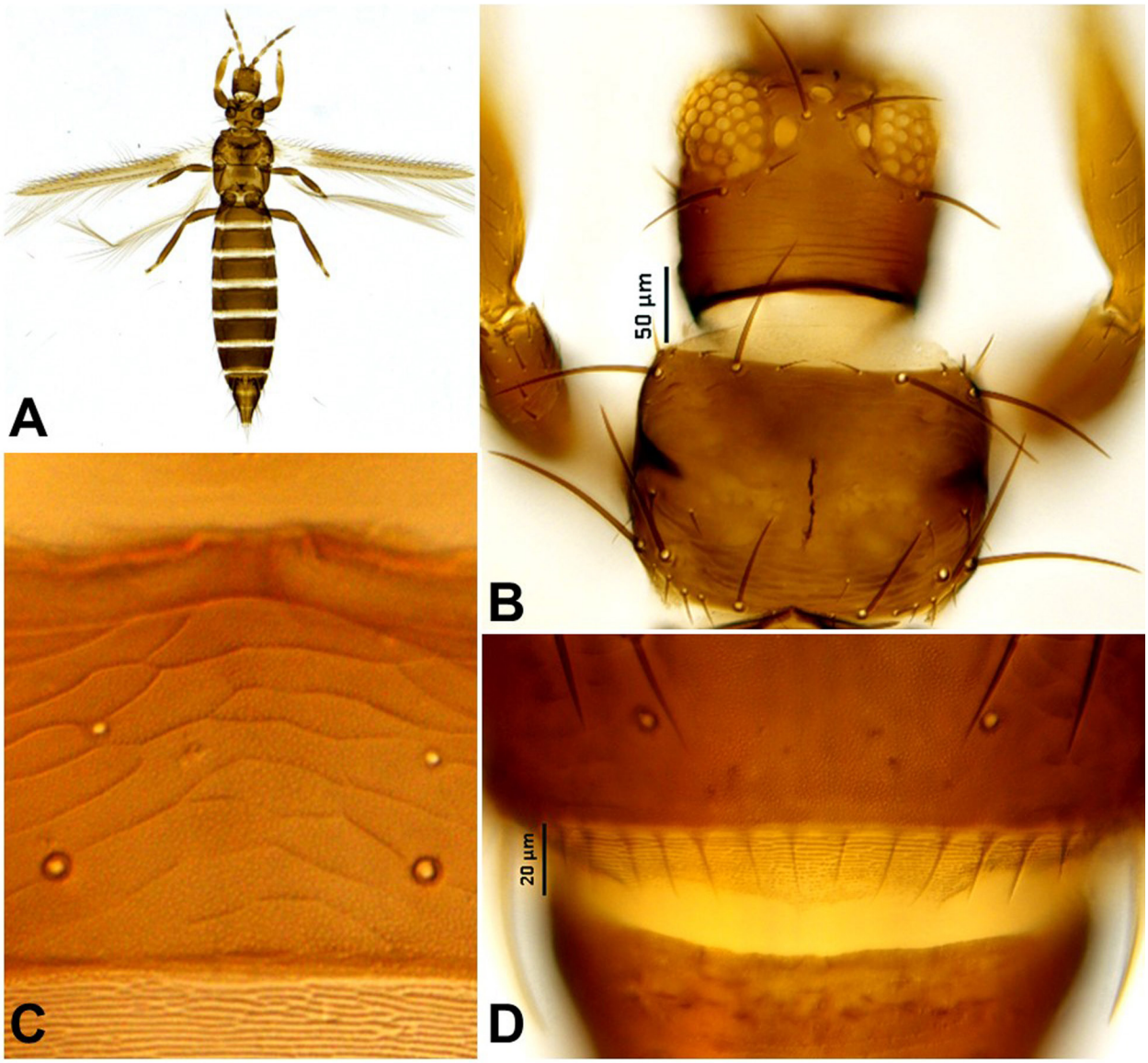

Figure 53. A–D) *Frankliniella tuberosi*. **A)** Body. **B)** Head and pronotum. **C)** Abdominal tergite I. **D)** Abdominal tergite VIII posteromarginal comb.

Frankliniella varipes Moulton (Fig. 54)

Diagnosis. This species is similar to *F. annulipes*, *F. regalis** and *Frankliniella rex** Hood. The pale fore and mid tibiae with the bicolored hind tibiae of *F. varipes* distinguishes it from the other three species.

Distinguishing features. *Color.* Body dark, femora dark, fore and mid tibiae pale, hind tibiae bicolored (Fig. 54A), forewings dark, basally paler (Fig. 54B). *Structure.* Antennal segment VI with 4–6 small subapical dorsal setae on large bases. Head with the PO1 setae, OC3 setae in position 2B (Fig. 54C). Pronotum with 2 mAM setae. (Fig. 54C). Upper surface of the hind coxae with microtrichia. Abdominal tergite VIII posteromarginal comb complete, microtrichia 11–13 µm.

Interception frequency. Rare.

Region(s) of interceptions. South America.

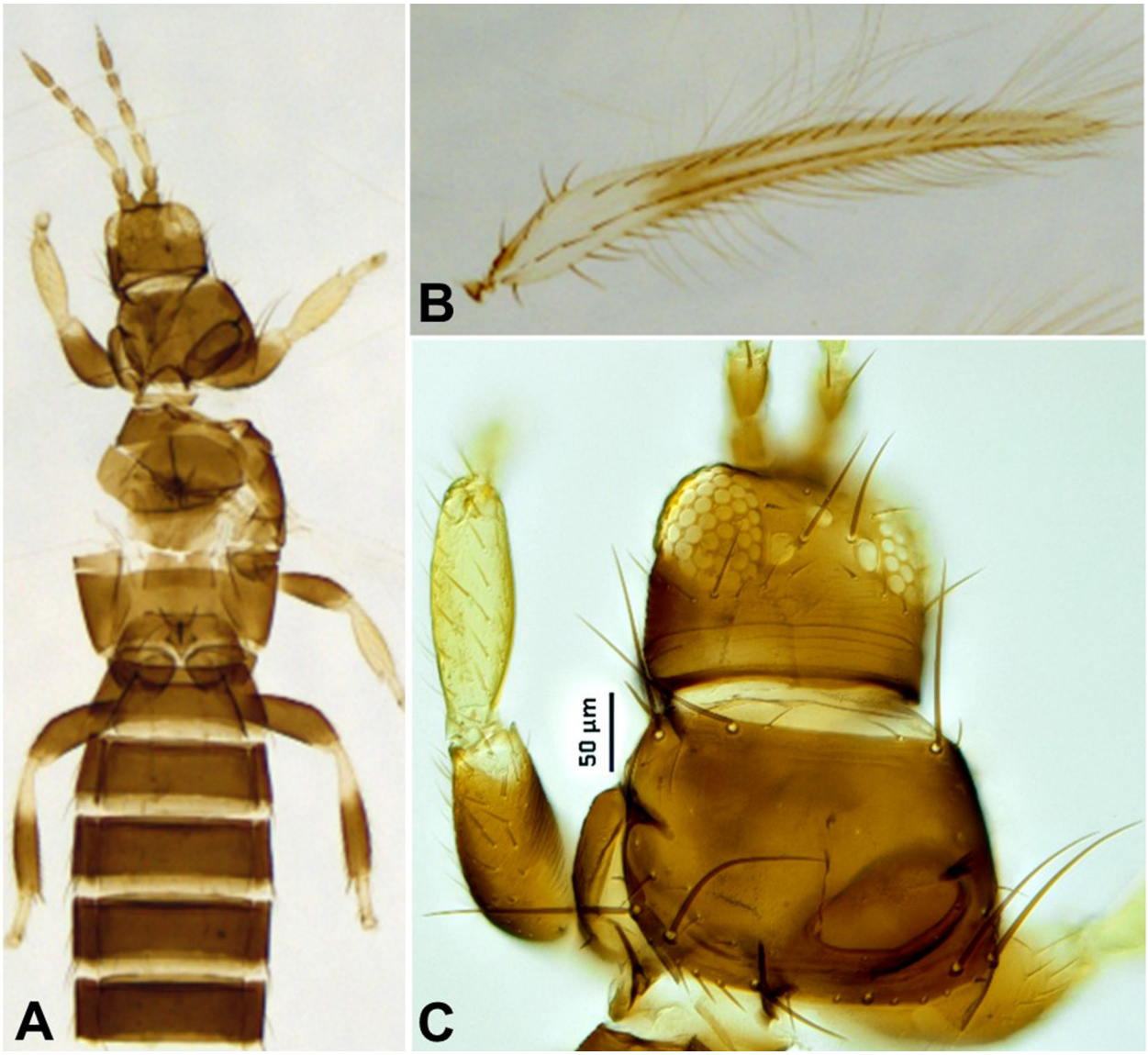

Figure 54. A–C) *Frankliniella varipes*. **A)** Body. **B)** Forewing. **C)** Head and pronotum.

Frankliniella williamsi Hood (Fig. 10B, 55)

Distinguishing features. *Color.* Body, forewings, legs pale (Fig. 55A). *Structure.* Antennal segment VIII at least 2.5 times as long as wide (Fig. 55B). Head with the PO1 setae, OC3 setae in position 2B and the distance between the posterior tangent of the hind ocelli and posterior margin of the head is 58–65 µm (Fig. 10B). Pronotum usually with 4 mAM setae. Upper surface of the hind coxae with microtrichia. Abdominal tergite VIII posteromarginal comb complete, microtrichia 15–19 µm (Fig. 55C). Abdominal tergite IX B1 setae usually more than 100 µm (Fig. 55C).

Interception frequency. Uncommon.

Region(s) of interceptions. North America, Central America and the Caribbean, South America.

Comments. *Frankliniella williamsi* is commonly intercepted from *Zea mays*. Interestingly, Bedoya et al. (2017) indicated that the migration and systems of exchange by archaic peoples contributed to the spread of maize throughout the Americas and the Caribbean. Therefore, it would be reasonable to speculate, based on the geographic range of *F. williamsi* plus its association with maize that it may have been inadvertently transported by early man.

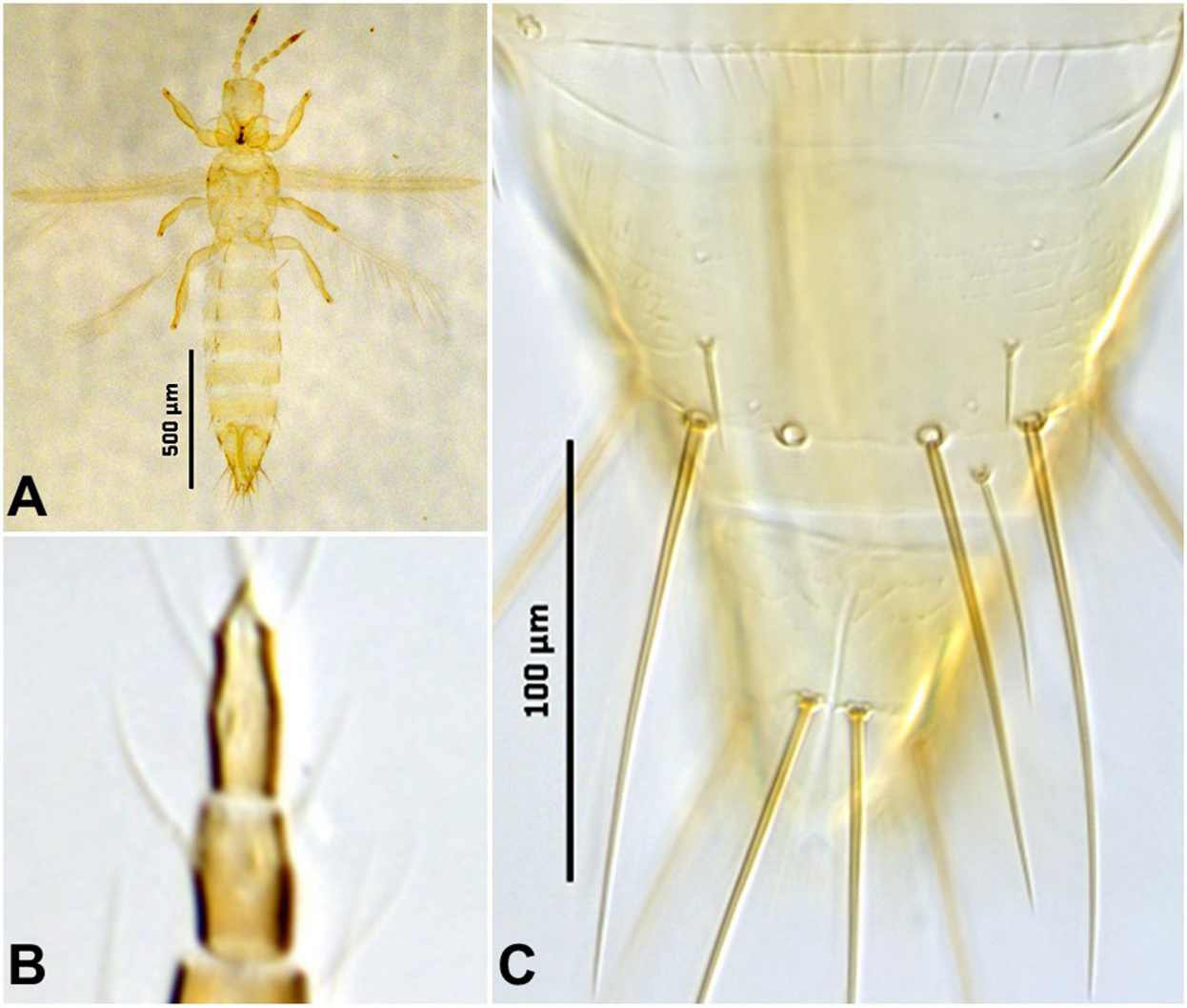

Figure 55. A–C) *Frankliniella williamsi*. **A)** Body. **B)** Antennal segments VII–VIII. **C)** Abdominal tergite VIII posteromarginal comb and tergites IX–X.

Frankliniella xanthaner Hood (Fig. 56)

Diagnosis. The shorter pronotal and abdominal tergite IX setae separates this species from the similar *F. cognata*.

Distinguishing features. *Color.* Body dark, forewings dark, basally pale, legs dark, fore tibiae paler, hind tibiae basally pale (Fig. 56A). Pigmented ventral eye facets with the 1-1-2 pattern. *Structure.* Antennal segment VI with a transverse line of 3 small setae. Head with the PO1 setae, OC3 setae in position 2B (Fig. 56B). Pronotum usually with 4 mAM setae (Fig. 56B). Abdominal tergite I with transverse lines of sculpture between the campaniform sensilla (Fig. 56C). Upper surface of the hind coxae with microtrichia. Abdominal tergite VIII posteromarginal comb complete, microtrichia 19–22 µm (Fig. 56D).

Interception frequency. Common.

Region(s) of interceptions. South America.

Comments. This species is usually intercepted associated with *Delphinium* sp. cut flowers. Molecular data presented by Skarlinsky and Rugman–Jones (2023) revealed that specimens morphologically interpreted as *F. xanthaner* may be a complex of cryptic species.

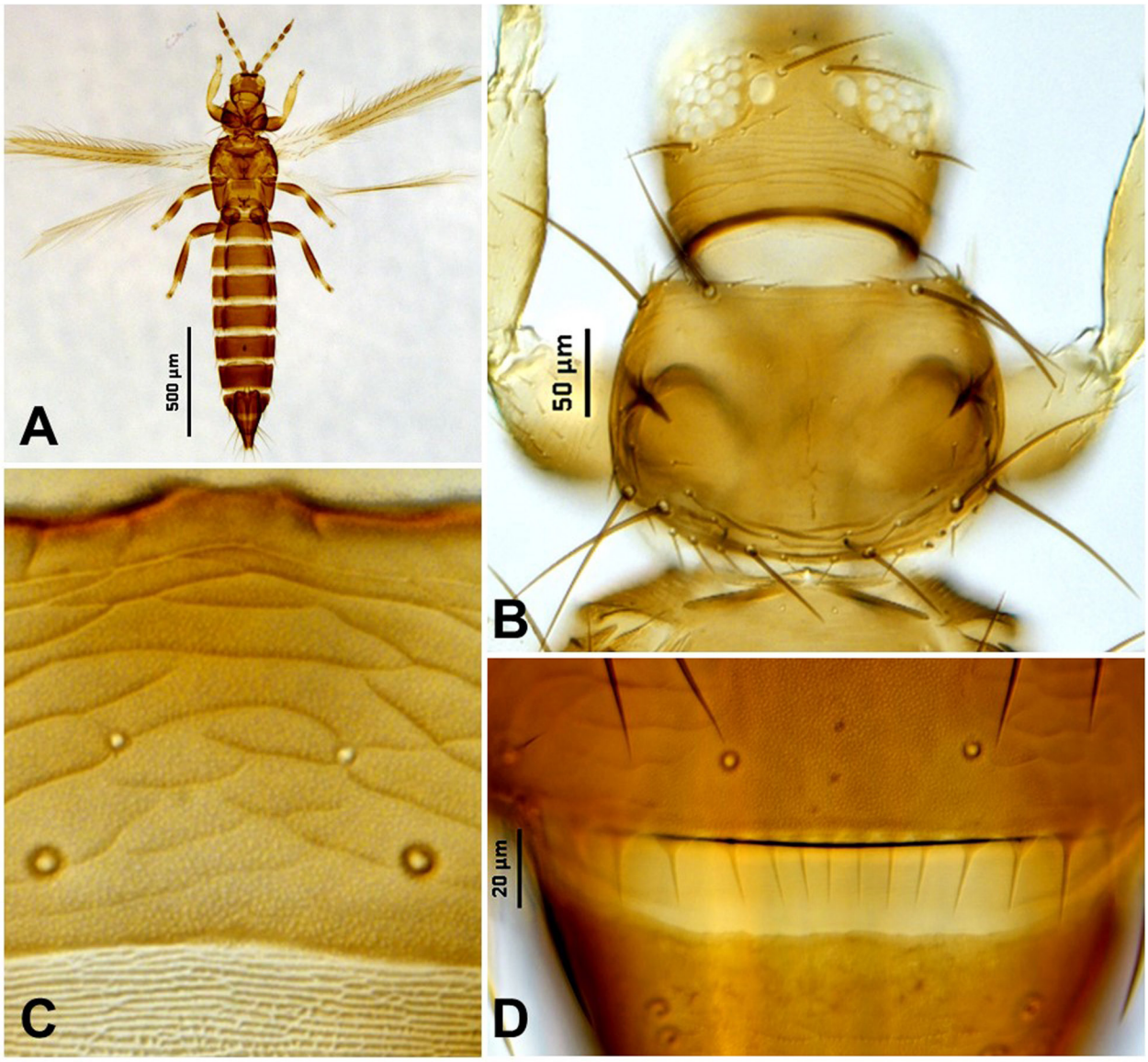

Figure 56. A–D) *Frankliniella xanthaner*. **A)** Body. **B)** Head and pronotum. **C)** Abdominal tergite I. **D)** Abdominal tergite VIII posteromarginal comb.

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