Systematic & Applied Acarology 29(11): 1553–1570 (2024) ISSN 1362-1971 (print)
https://doi.org/10.11158/saa.29.11.8 ISSN 2056-6069 (online)

Article http://zoobank.org/urn:lsid:zoobank.org:pub:6760D8D2-013C-4CAB-AEC0-6646876B9E81

First record of *Aegyptobia* Sayed (Acari: Tenuipalpidae) from South America: a new species and redescription of *A. pennatulae* Baker & Tuttle from Peru

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Abstract

The genus *Aegyptobia* is recorded from South America for the first time, with the description of a new species collected from the branches of a native forest tree, *Neltuma piurensis* (Fabaceae), from Department of Piura in north-western Peru. The species *A. pennatulae* Baker & Tuttle was also collected from the same host, and is redescribed based on the types and new material. Observations during summer and autumn revealed *A. pennatulae* as the predominant species, and that *N. piurensis* is likely an accidental host for *A. peruensis* **sp. nov.**

Key words: Trombidiformes, flat mites, phytophagous mites, range extension, host extension, algarrobo

Introduction

The Tenuipalpidae is distributed throughout the world and contains many economically significant pest species (Mesa *et al.* 2009; Beard *et al.* 2012; Castro *et al.* 2020). This family is currently comprised of 41 genera and 1105 described species (Mesa *et al.* 2009; Castro *et al.* 2024). *Aegyptobia* Sayed, 1950, with 111 described species (107 valid), is the third biggest in the family (Mesa *et al.* 2009; Castro *et al.* 2024). The genus has been reported from 30 countries in association with 50 families of host plants, mostly from Cupressaceae, Poaceae, Asteraceae, and Amaranthaceae, and many species were described from arid habitats with high temperatures (Castro *et al.* 2024). The 55 species of *Aegyptobia* reported in the Americas were described from the USA (35), Mexico (19), and Canada (1), with no species yet recorded from South America (Pritchard & Baker 1952, 1958; Baker & Pritchard 1953; Baker & Tuttle 1964; Baker & Tuttle 1972; Baker *et al.* 1975; Bury & Krantz 1977; Baker & Tuttle 1987; Mesa *et al.* 2009; Castro *et al.* 2024). Here we record the first two species from South America, by describing one new species *A. peruensis* **sp. nov.** from Peru, and redescribing the Mexican species *A. pennatulae* Baker & Tuttle based on types and new material collected in Peru.

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Currently, only six species of Tenuipalpidae are known from Peru (Escobar-Garcia & Andrade 2020; Escobar-Garcia *et al.* 2021; Huanca *et al*. 2021; Castro *et al.* 2024). The two newly recorded species were collected from *Neltuma piurensis* (L. Vásquez, Escurra & Huamán) C.E. Hughes & G.P. Lewis (Fabaceae; previously placed in *Prosopis* L.), locally known as algarrobo, a native forest tree in Peru recognized for its important social, economic and environmental benefits (SERFOR 2021; Hughes *et al.* 2022). The taxonomic placement of the genera *Prosopis* and *Neltuma* (and their relatives) varies globally, with names like Fabaceae, Mimosaceae, Leguminosae, and Caesalpiniaceae in use. Recent studies have suggested that *Prosopis* (approx. 57 species) is polyphyletic, and subsequently lead to the establishment of various segregate genera, including *Neltuma*. These genera are distributed mostly in the Americas, with a few outlying species in the Indian and north African regions (Hughes *et al.* 2022; Estrada-Castillon *et al.* 2024).

Previously, only one flat mite species, *Aegyptobia vannus* Pritchard & Baker, had been recorded from the *Prosopis*/*Neltuma* group, being described from *Neltuma glandulosa* (Torr.) in Mexico. *Aegyptobia vannus* was later recorded in Arizona, USA on *N. juliflora* (Sw.) Raf. [previously *Prosopis juliflora* (Sw.) DC.], and *Strombocarpa pubescens* (Benth.) A. Gray [previously *P. pubescens* Benth] (Baker & Tuttle 1964; Hughes *et al.* 2022; Castro *et al.* 2024). Algarrobo or *Neltuma piurensis*, was vital as a wild food source for pre-hispanic cultures, and some species underwent long distance translocation by humans and their livestock within the Americas in pre-Colombian times (McRostie *et al.* 2017). The collection of *A. pennatulae* in Peru and the resultant range extension from Mexico may reflect this historical context.

Materials and Methods

Mites were collected from branches (20cm long) of the host plant *N. piurensis* at the campus of the Universidad Nacional de Piura (UNP), Peru (5°10'46.89"S; 80°37'04.31"W; 36 m.a.s.l.), between December 2020 to June 2021. Sampling involved collecting 10 branches with necrotic spots every 2 weeks. Samples were placed in paper bags and transferred to the laboratory of Entomology (SL01LA68), of the UNP, Peru. Mites were collected with a fine-tipped brush under the stereomicroscope (ZEISS Stemi 508) directly from the branches, mounted dorso-ventrally on glass microscope slides with 7µl Hoyer's medium, and dried in an oven at 50°C for 7 days (Walter and Krantz 2009). The coverslips were subsequently ringed with nail polish, and the morphological details of the mites were examined under a Nikon Eclipse E200 phase-contrast compound microscope. Specimens were measured with an ocular micrometer, and measurements are presented in micrometers (µm). Setal measurements are presented as a range for all specimens followed by the value for the holotype in square brackets. The lengths of setae were measured from the setal base to the tip; distances between setae bases were measured as the distance from center to center of setal bases. Body length was measured between the posterior border of the idiosoma and the tip of the rostrum. Setal terminology follows Mesa *et al.* (2009). The images were taken using an AxioCam MRc5 camera mounted on a Zeiss Axioscope AX10 Lab.A1 phase-contrast compound microscope or a Nikon Eclipse 80i with Capture 2.3 imaging software. The type specimens are deposited at the following institutions: SL01LA68—Acarology collection of the laboratory of Entomology of the UNP, Piura, Peru; IAM—Acarology Laboratory of the Instituto Agroforestal Mediterráneo of the Universitat Politècnica de València (UPV), Valencia, Spain; ESALQ—Department of Entomology and Acarology, Luiz de Queiroz College of Agriculture, University of São Paulo (USP), Brazil; NMNH—National Insect and Mite Collection, National Museum of Natural History, Smithsonian Institution, located at the Systematic Entomology Laboratory (SEL), USDA, Beltsville, MD, USA; QM—Queensland Museum, PO Box 3300, South Brisbane, Queensland 4101, Australia; and

DZB—Collection of Acari, Departamento de Zoologia e Botânica, UNESP, São José do Rio Preto, State of São Paulo, Brazil.

Results

Family Tenuipalpidae Berlese, 1913
Genus *Aegyptobia* Sayed, 1950
Diagnosis —Based on Mesa *et al.* 2009, and Seeman & Beard 2011.
Type species—*Aegyptobia tragardhi* Sayed, 1950
Species group *tragardhi*
Type species—*Aegyptobia tragardhi* Sayed, 1950
Diagnosis—Based on Meyer (1979), and Kamran *et al.* (2016) with tarsal claws uncinate, claw-like.

Aegyptobia pennatulae Baker & Tuttle, 1987

Type material examined: Holotype: female (Fig. 1A), Chapala, Jalisco, Mexico, ex. *Acacia pennatula* (Cham. & Schlecht.) Benth. (Mimosaceae), 29.vi.1974, coll. D.M. Tuttle, E.W. Baker and M.J. Abbatiello. **Paratypes:** female, on same slide as holotype; one female, Fresnillo, Zacatecas, Mexico, ex. *Mimosa biuncifera* Benth. (Mimosaceae), 03.vii.1974, coll. D.M. Tuttle, E.W. Baker and M.J. Abbatiello; one protonymph (poor condition), 19.2 km east of Morelia, Michoacan, Mexico, ex. *Mentha sp.* L., (Lamiaceae), 03.vii.1974, coll. D.M. Tuttle, E.W. Baker and M.J. Abbatiello. All in USNM.

Other material examined: 50 females, nine deutonymphs, and one protonymph, Piura, Peru, campus of the UNP, 05°10'46.89"S 80°37'04.31"W, 36 m.a.s.l., ex. *Neltuma piurensis* (Fabaceae), collected 18.i.2020 to 21.xi.2021, coll. H.A. Escobar-Garcia. Deposited in SL01LA68 (26 females, seven deutonymphs, and one protonymph), IAM (14 females), ESALQ (two females), NMNH (three females), QM (two females, one deutonymph), DZB (three females, one deutonymph).

General diagnosis. Female: Tarsal claws uncinate. Anterior margin of prodorsal shield with deep broad notch; propodosomal and opisthosomal setae elongate obovate with weakly developed basal stalk, minute barbs on dorsal surface and fanned ridges on ventral surface; setae strongly curled to form scoop-shape; length of dorsal setae in range 12–25. Numerous minute pores on dorsal idiosoma; large pores apparently absent but with pore-like depressions between d_1 and d_2. Genital and anal plates developed, smooth. Cuticle between 3*a*–4*a* with transverse striae becoming longitudinal laterally. Palp (trochanter to tarsus) 0-0-0-2-3(1ω). Legs I–IV setal counts: coxae 2–2-1-1; trochanters 1-1-2-1; femora 4-4-2-1; genua 2-2-0-0; tibiae 4-4-3-3; tarsi 8(1ω)-8(1ω)-4-4. Tarsi I–IV with *tc″* absent. Seta *l″* absent on tibiae I–II. Seta *d* on femora I–III and genua I–II similar in form to dorsal setae (as in many species in the genus). Ratio v_2/v_2–v_2: 0.6 ± 0.0 (0.5–0.7).

Description. Female (n=13):
(Figs. 1–8)

Body. Idiosoma oval in shape, with pair of lateral eyes on each side of propodosoma; length 215–240 [220].

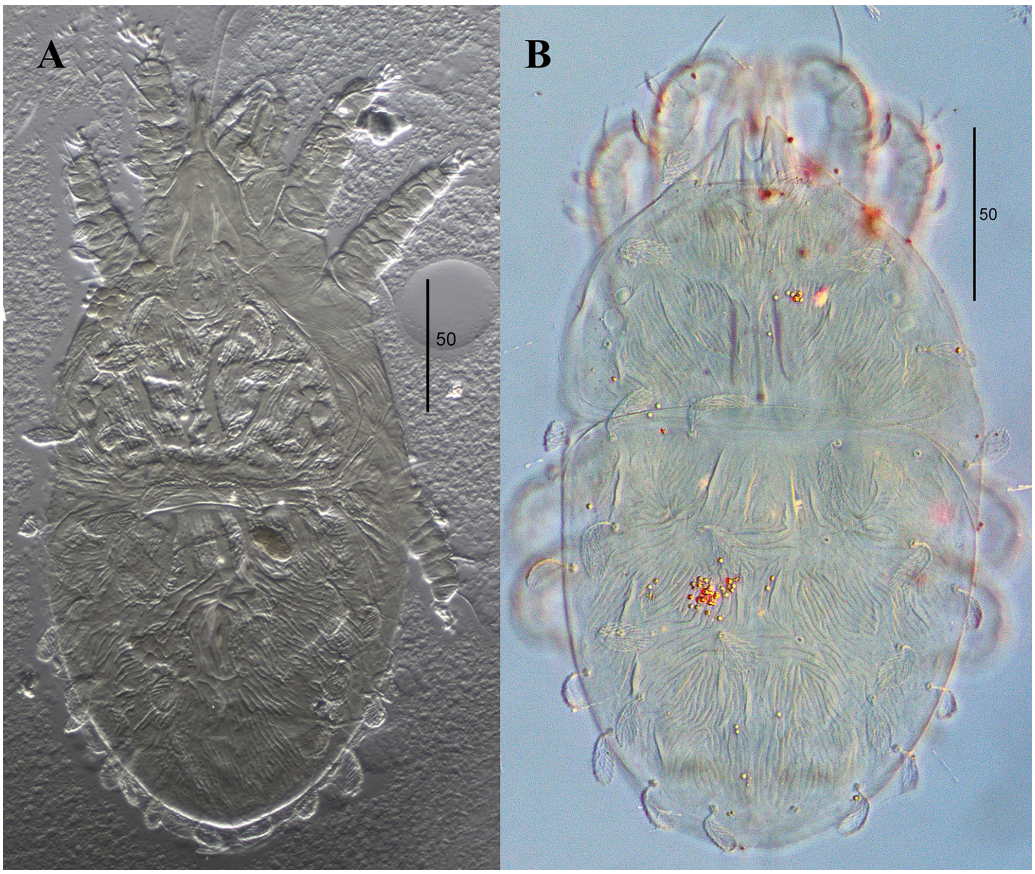

FIGURE 1. *Aegyptobia pennatulae* Baker & Tuttle adult female dorsal habitus: **A**—holotype; **B**—specimen from Peru.

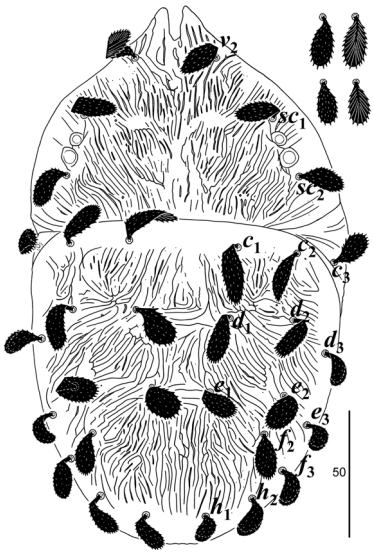

FIGURE 2. *Aegyptobia pennatulae* Baker & Tuttle adult female from Peru. Dorsal habitus, with detail of dorsal and ventral aspects of setae.

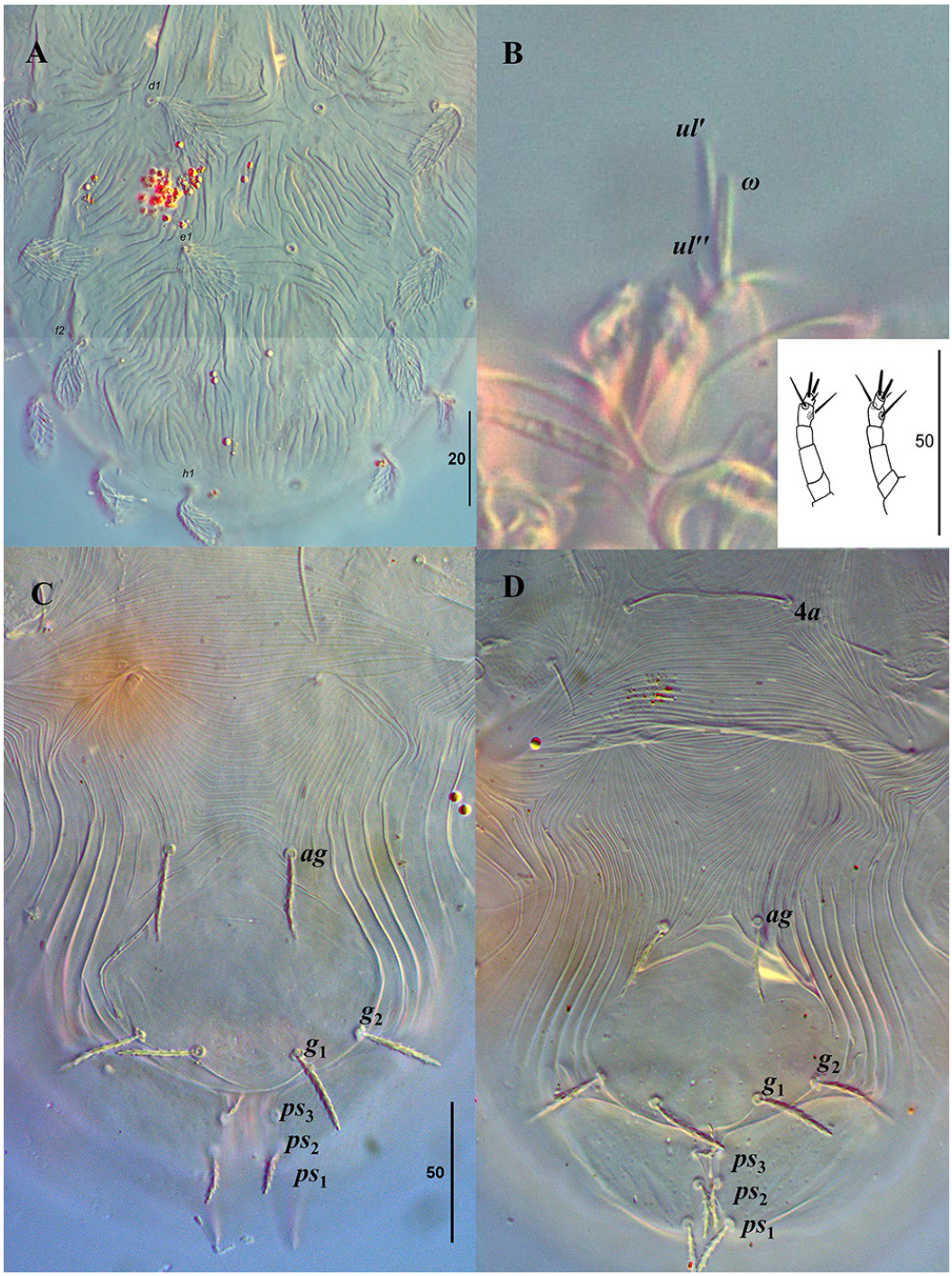

FIGURE 3. *Aegyptobia pennatulae* Baker & Tuttle (Adult female). **A**—Dorsal opisthosoma, specimen from Peru; **B**—Palp tarsi, indicating three phaneres present [two eupathidia (*ul′* and *ul″*) and a solenidion (*ω*)] with insertion of detail of the palp; **C** and **D**—Posterior venter, indicating variation in striae pattern anterior to setae *ag*. Note that the setae are barbed.

Idiosomal dorsum. Idiosoma oval in shape, with corrugated-rugose sculpturing, and a total of 16 pairs of elongate obovate, barbed setae (Figs. 1, 2). Dorsal cuticle with fine parallel sulci aligned in varying directions to form fine corrugate-rugose sculpturing. Prodorsum with regions of mostly oblique narrow parallel corrugations. Opisthosoma with a patchwork pattern of regions of narrow oblique and longitudinal corrugations (Fig. 3A); corrugations mostly longitudinal centrally becoming oblique laterally; pygidial region between e_1–h_1 with mostly longitudinal corrugations. Anterior margin of prodorsal shield with deep broad notch (Figs. 1B, 2); two pairs of eyes anterior to sc_2 setae, and three pairs of setae (v_2, sc_1 and sc_2) ; ratio v_2/v_2–v_2: 0.5–0.7 [0.7]. Numerous minute pores present, and pair pore-like depressions between setae d_1 and d_2. Thirteen pairs of setae ($c_{1–3}$, $d_{1–3}$, $e_{1–3}$,$f_{2–3}$, $h_{1–2}$). Length of dorsal setae: v_2 15–23 [23], sc_1 18–22 [22], sc_2 15–20 [20], c_1 21–25 [24], c_2 18–22 [21], c_3 12–17 [17], d_1 16–21 [21], d_2 17–21 [21], d_3 12–15 [15], e_1 13–16 [16], e_2 15–18 [17], e_3 12–16 [16], f_2 12–16 [16], f_3 13–16 [16], h_1 13–15 [14], h_2 13–16 [16]. Distance between setae: v_2–v_2 28–34 [33], sc_1–sc_1 67–75 [75], sc_2–sc_2 84–94 [90], c_1–c_1 40–45 [43], c_2–c_2 82–92 [90], c_3–c_3 100–115 [110], d_1–d_1 32–38 [38], d_2–d_2 80–90 [88], d_3–d_3 104–112 [111], e_1–e_1 17–24 [23], e_2–e_2 72–82 [80], e_3–e_3 90–100 [95], f_2–f_2 62–68 [65], f_3–f_3 75–85 [80], h_1–h_1 23–26 [24], h_2–h_2 52–60 [60].

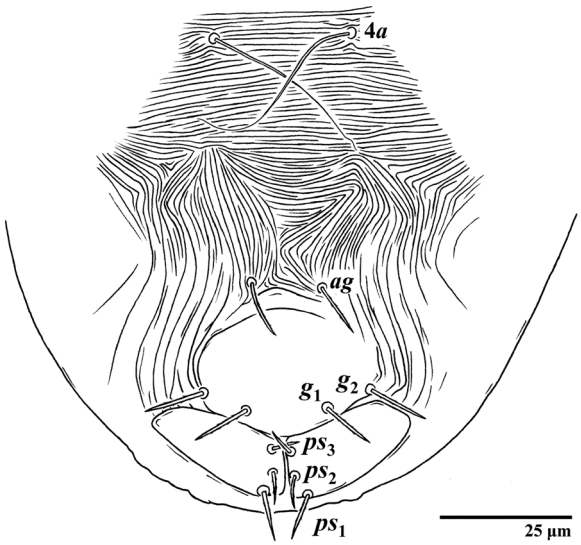

FIGURE 4. *Aegyptobia pennatulae* Baker & Tuttle adult female from Peru, posterior venter.

Gnathosoma. Ventral subcapitulum with a pair of short, slender and simple setae: *m* 5–8; distance between *m*–*m* 10–11. Palp with a pair of supracoxal setae *ep*; palp trochanter, femur, genu without setae; palp tibia with two tactile setae (*d*, *l″*); palp tarsus with three phaneres - two eupathidia: *ul′* (6–7) [5], and *ul″* (3) and one solenidion *ω* (6) (Fig. 3B).

Idiosomal venter. Intercoxal area anterior to setae 1*b*–1*a* with fine longitudinal striae (can be indistinct); cuticle with strong transverse striae between setae 1*a*–3*a*; area between 3*a* to 4*a* with fine transverse striae becoming longitudinal laterally; area posterior to setae 4*a* with coarse transverse striations; area anterior to aggenital setae *ag* with variable pattern of fine striae: weak concave to transverse anteriorly becoming arching between *ag*–*ag* (Figs. 3C, 3D); strongly concave or broadly V-shaped anteriorly becoming oblique and longitudinal towards *ag*–*ag* (Figs. 3D, 4). Genital plate indicated by strong longitudinal folds in lateral cuticle, smooth, with setae $g_{1–2}$ inserted along posterior margin. Pseudanal setae $ps_{1–3}$ inserted longitudinally along medial margins of well-defined smooth anal plates (Figs. 3C, 3D, 4). Most ventral setae fine, smooth to weakly barbed, except 2*c*,

ag, g_{1-2}, ps_{1-3} thickened and densely barbed. Ratio 4*a*/*ag*: 2.3–3.1. Length of ventral setae: 1*a* 30–45 [45], 1*b* 13–27 [13], 1*c* 9–10 [10], 2*b* 15–18 [17], 2*c* 15–18 [16], 3*a* 10–13 [12], 3*b* 12–13 [13], 4*a* 28–46 [38], 4*b* 11–14 [13], *ag* 11–15 [14], g_1 11–15 [15], g_2 11–16 [16], ps_1 8–10 [9], ps_2 7–9 [8], ps_3 6–7 [7]. Distance between setae: 1*a*–1*a* 18–22 [18], 3*a*–3*a* 34–36 [35], 4*a*–4*a* 22–27 [25], *ag*–*ag* 12–16 [15], g_1–g_1 14–18 [16], g_2– g_2 29–35 [30].

Spermatheca. not visible

Legs. Legs I–IV short (Figs. 5A–D). Dorsal setae on femora I–III and genua I–II similar in form to dorsal body setae. Supracoxal setae *e*I. Number of setae on leg segments with solenidia (on tarsi) given in parentheses and included in setal counts: coxae 2-2-1-1; trochanters 1-1-2-1; femora 4-4-2-1; genua 2-2-0-0; tibiae 4-4-3-3; tarsi 8(1ω)-8(1ω)-4-4. Tarsi I–IV with *tc″* absent. All apoteles terminate in two uncinate claws and pad-like empodium, each with tenent hairs. Solenidion *ω″* ta I 7–8 [8], ta II 6–7 [7].

Male. Unknown.

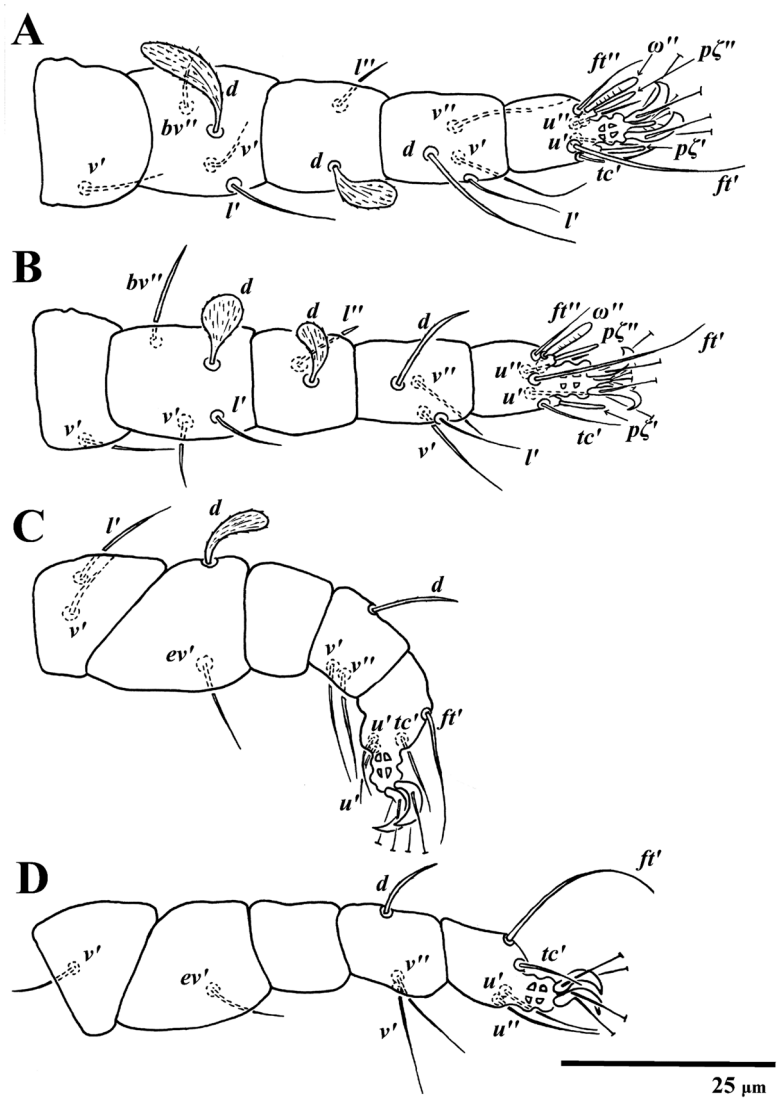

FIGURE 5. *Aegyptobia pennatulae* Baker & Tuttle adult female from Peru, detail of left side legs: **A—**leg I; **B**—leg II; **C**—leg III; **D—**leg IV.

Deutonymph (n=9):
(Fig. 6)

Body. Ovoid body, smaller than female; length (207–225).

Idiosomal dorsum. Weak prodorsal shield indicated, smooth; opisthosoma without sculpturing, with widely spaced transverse cuticular folds between c_1 and e_1; weak pygydial shield indicated by arching folds between setal pairs e_1, f_2, h_1 (Fig. 6A). Anterior margin of prodorsal shield smoothly rounded, without projection or notch; ratio v_2/v_2–v_2: 0.4–0.5. Length of dorsal setae: v_2 13–16, sc_1 14–16, sc_2 15–16, c_1 15–20, c_2 12–15, c_3 10–13, d_1 14–16, d_2 14–16, d_3 10–12, e_1 10–12, e_2 12–14, e_3 9–12, f_2 10–12, f_3 10–14, h_1 8–9, h_2 9–10. Distance between setae: v_2–v_2 30–33, sc_1–sc_1 65–68, sc_2–sc_2 78–85, c_1–c_1 34–35, c_2–c_2 70–72, c_3–c_3 105–113, d_1–d_1 26–29, d_2–d_2 58–62, d_3–d_3 92–103, e_1–e_1 16–18, e_2–e_2 58–63, e_3–e_3 80–93, f_2–f_2 48–53, f_3–f_3 68–78, h_1–h_1 15–17, h_2–h_2 44–50.

Gnathosoma. Similar to that of female. Ventral subcapitulum with a pair of slender and simple setae: *m* 5–6 short. Distance between *m*–*m* 9–10. Palps as in adult female.

Idiosomal venter. Similar to female except with longitudinal striae between *ag* to g_1 becoming oblique around genitoanal region; anal plates weakly developed. Pseudoanal setae $ps_{1–3}$ inserted longitudinally along medial margins of anal plates. All ventral setae simple and finely barbed except 2*c*, *ag*, $g_{1–2}$, and $ps_{1–3}$ densely barbed. Ratio 4*a*/*ag*: 0.9–1.5. Length of ventral setae: 1*a* 28–37, 1*b* 17, 1*c* 7, 2*b* 7, 2*c* 17–18, 3*a* 7–8, 4*a* 10–15, *ag* 9–11, g_1 8–11, ps_1 5–6, ps_2 5–6, ps_3 3–4. Distance between setae: 1*a*–1*a* 18–20, 3*a*–3*a* 32–35, 4*a*–4*a* 22–27, *ag*–*ag* 14–15, g_1–g_1 12–15.

Legs. Setal formula for legs I–IV and form of setae as in adult female except: trochanters 1-1-2-0; femora 3-3-2-1 (Figs. 6B–E). Solenidion *ω″* on ta I 6–7 and ta II 5–6. Ontogenetic additions: setae *v′* added to tr I–III; *d*, *l″* added to ge I–II; *tc′* added to ta I, II, IV (n.b. *tc′* added to ta III in protonymph).

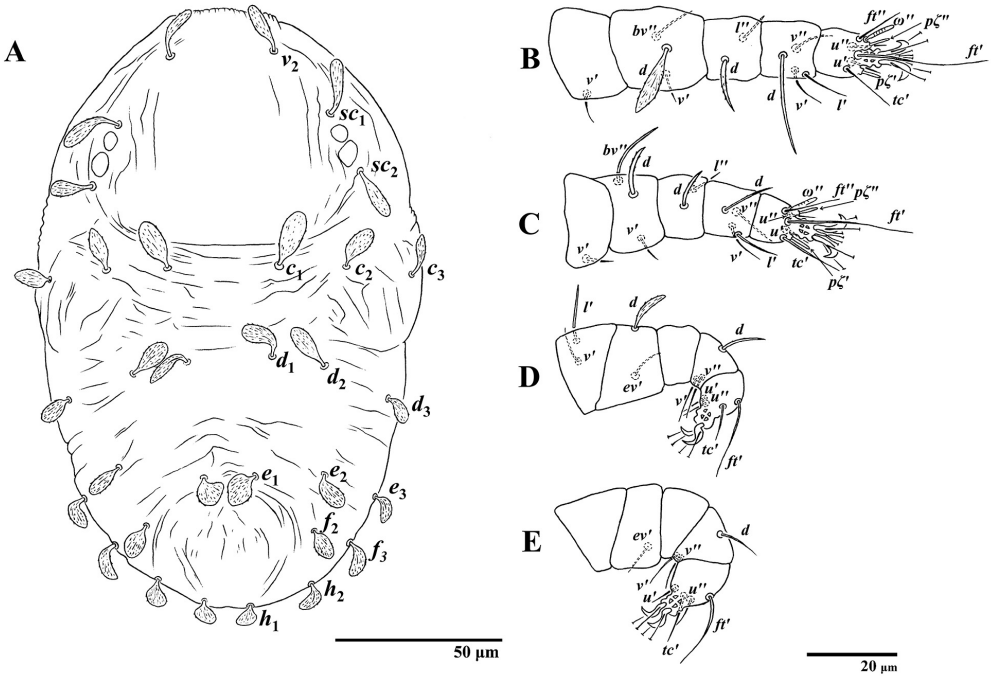

FIGURE 6. *Aegyptobia pennatulae* Baker & Tuttle (Deutonymph); **A**—dorsal idiosoma; **B**—left leg I; **C**—left leg II; **D—**left leg III; **E**—left leg IV.

Protonymph (n=1):
(Fig. 7)

Body. Ovoid body, smaller than deutonymph; length 207.

Idiosomal dorsum. Similar to deutonymph but with less developed shields (Fig. 7A). Length of dorsal setae: v_2 14, sc_1 14, sc_2 12, c_1 15, c_2 11, c_3 11, d_1 15, d_2 12, d_3 10, e_1 9, e_2 9, e_3 9, f_2 9, f_3 8, h_1 8, $h_2$10. Distance between setae: v_2–v_2 30, sc_1–sc_1 55, sc_2–sc_2 70, c_1–c_1 30, c_2–c_2 65, c_3–c_3 98, d_1–d_1 20, d_2–d_2 52, d_3–d_3 84, e_1–e_1 14, e_2–e_2 55, e_3–e_3 68, f_2–f_2 40, f_3–f_3 48, h_1–h_1 12, h_2–h_2 35.

Gnathosoma. Similar to that of deutonymph. Ventral subcapitulum with a pair of slender and simple setae: *m* 5. Distance between *m*–*m* 10.

Idiosomal venter. Similar to that of deutonymph in all respects but with setae 2*c*, 4*a*, 4*b*, g_1, and g_2 absent. Length of ventral setae: 1*a* 30, 3*a* 10, *ag* 8, ps_1 5, ps_2 5, ps_3 3. Distance between setae: 1*a*–1*a* 18, 3*a*–3*a* 30, *ag*–*ag* 15.

Legs. Setal formula for legs I–IV (Figs. 7B–E): coxae 2-1-1-0; trochanters 0-0-1-0; femora 3-3-2-1; genua 0-0-0-0; tibiae 4-4-3-3; tarsi 7(1ω)-7(1ω)-4-3. Solenidion *ω″* ta I 6 and ta II 5.

Distribution. Mexico, Peru.

Remarks. All known life stages of these mites are carmine red. The male and larva were not collected. The setae on ge I–II were named *d* (deutonymphal seta) and *l″* (larval seta) instead of *l′*–*l″* (as delayed larval setae) due to the form of seta *d* present in other species of *Aegyptobia* (and many other tenuipalpid taxa) with three setae present on ge I–II (*d*, *l′*, *l″*) which matches the dorsal setae.

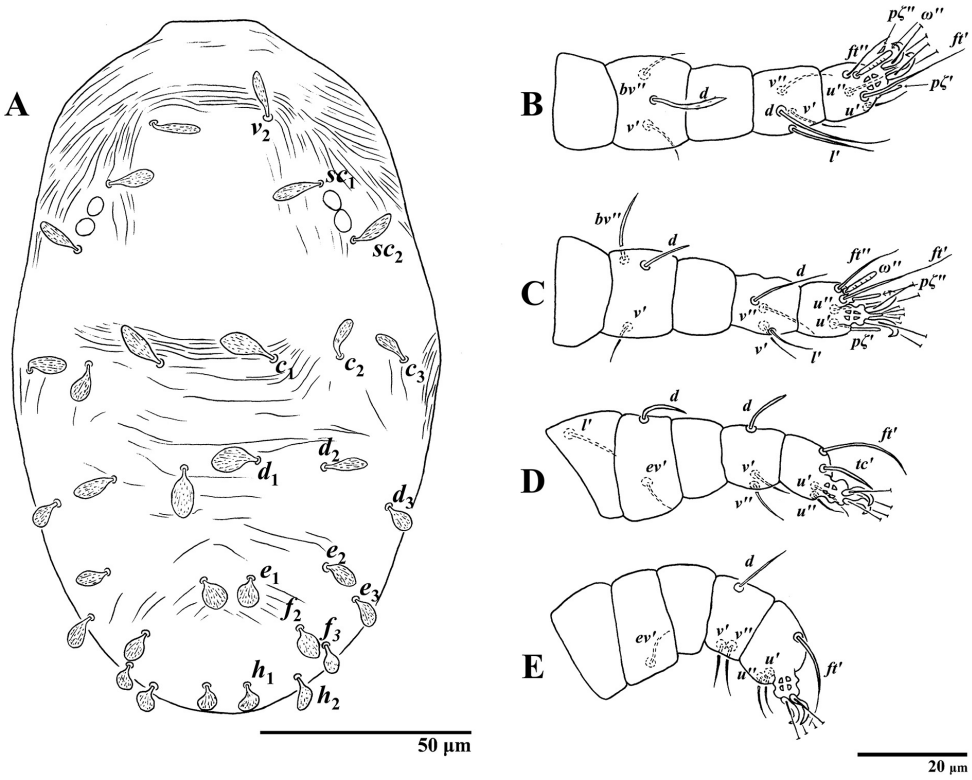

FIGURE 7. *Aegyptobia pennatulae* Baker & Tuttle (Protonymph); **A**—dorsal idiosoma; **B**—left leg I; **C**—left leg II; **D**—left leg III; **E**—left leg IV.

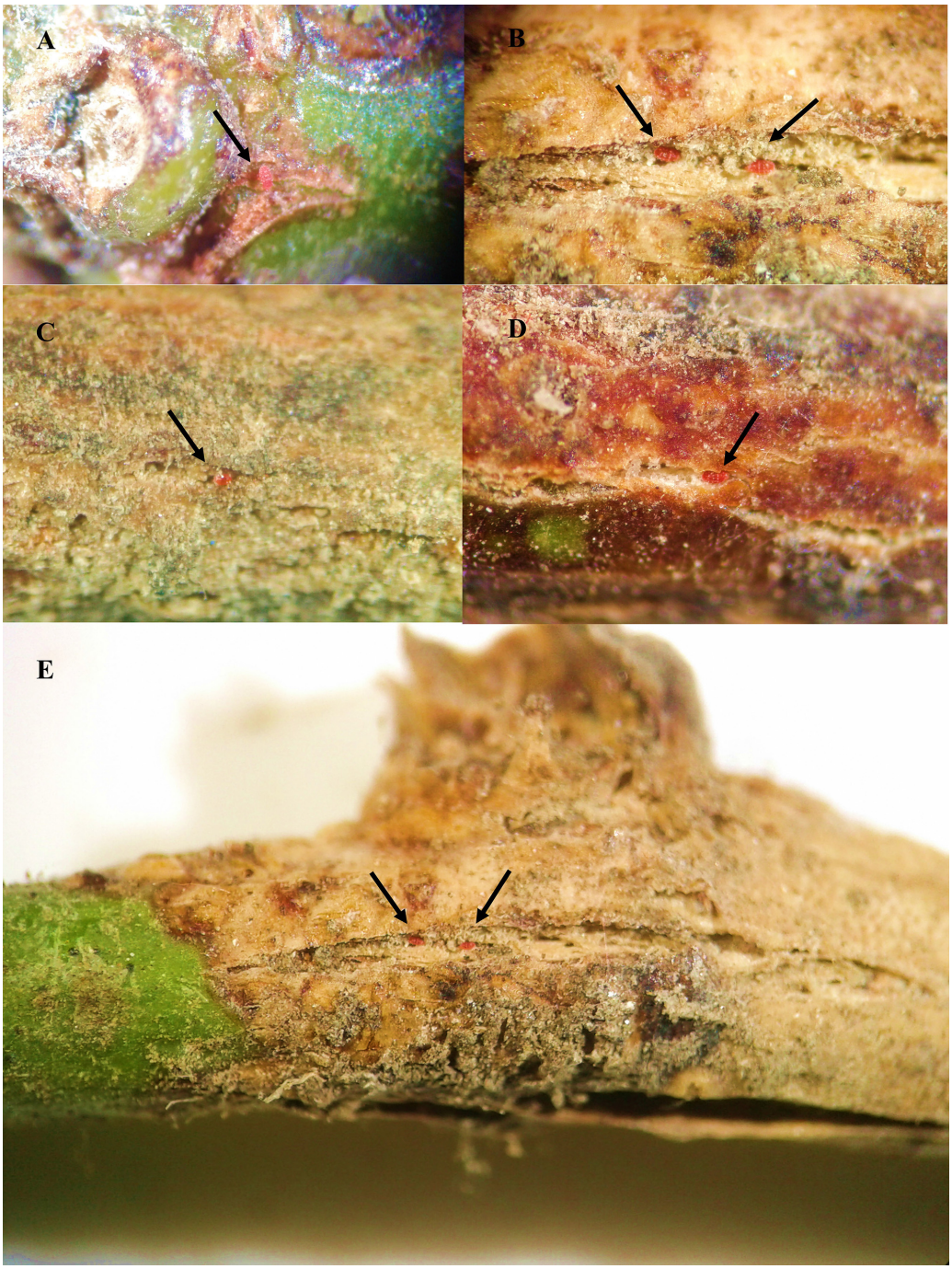

FIGURE 8. *Aegyptobia pennatulae* Baker & Tuttle on the host plant: **A**–**E** symptoms of damage to branches of host tree algarrobo *Neltuma piurensis* (Fabaceae); arrows indicate individual females indicated except in **C** where an egg is indicated.

Aegyptobia peruensis Escobar-Garcia & Beard **sp. nov.**
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Type material: Holotype female, Peru, campus of the UNP, Piura, (05°10'46.89"S; 80°37'04.31"W; 36 m.a.s.l.), ex. *Neltuma piurensis*, 1.ii.2021; coll. H.A. Escobar-Garcia. **Paratypes**: same data as holotype except collection dates – one female collected 18.i.2021 (SL01LA68); three females 18.i.2021 and one female 07.vi.2021 (IAM); one female 01.ii.2021 (NMNH); one female 24.v.2021 (QM).

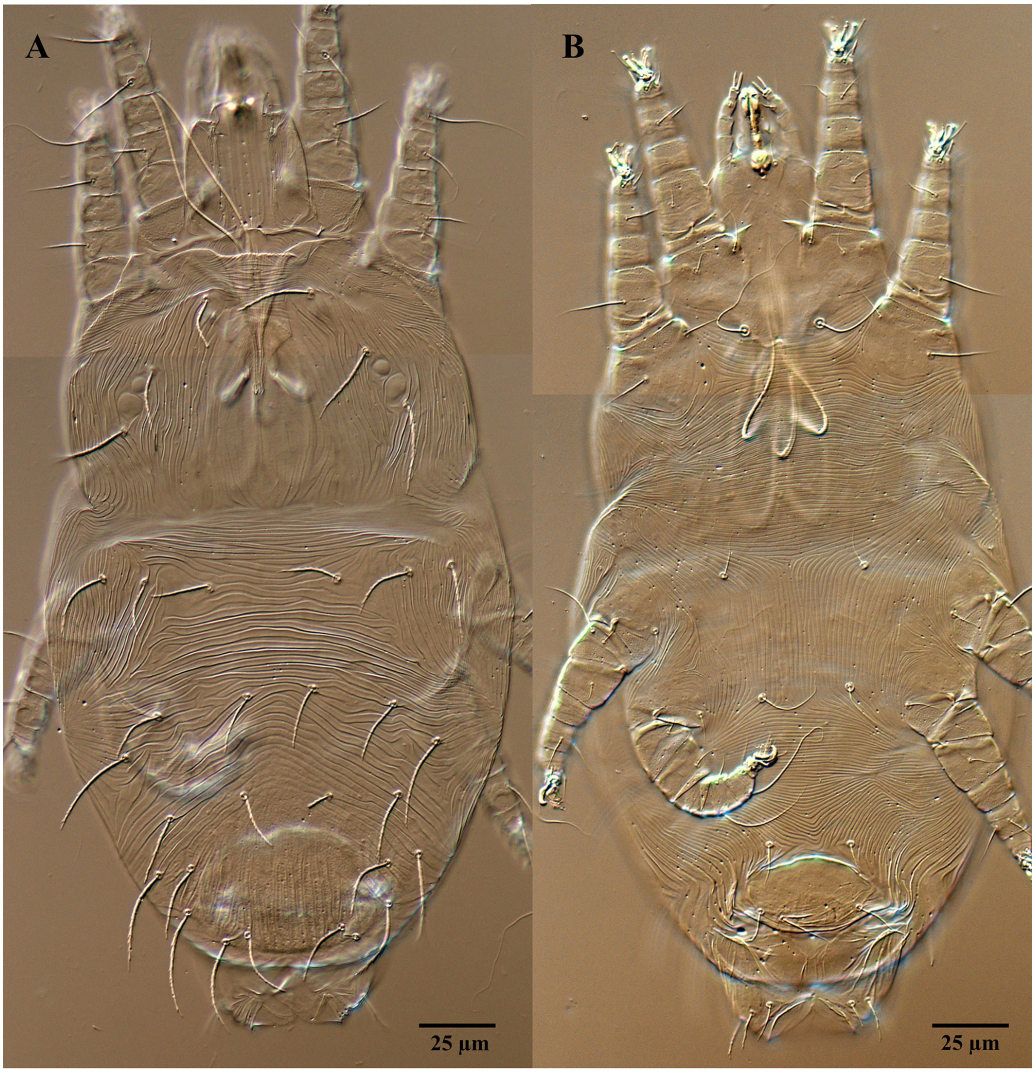

FIGURE 9. *Aegyptobia peruensis* **sp. nov.,** (Paratype, adult female); **A**—dorsal idiosoma; **B**—venter idiosoma (image by F. Ferragut).

General diagnosis. Female: Tarsal claws uncinate. Anterior margin of prodorsal shield rounded, without projection or notch; dorsal setae slender lineate, barbed; dorsal shields not developed. Propodosomal cuticle smooth centrally with weak longitudinal striae sublaterally becoming stronger laterally. Dorsal opisthosoma with weak transverse striae between c_1–e_1,

increasingly arched towards e_1; striae e_1–h_1 longitudinal becoming oblique laterally. Propodosomal and opisthosomal slender, linear, barbed setae; length of dorsal setae in range 17–34. Dorsal opisthosomal pores apparently absent. Genital and anal plates weakly developed, smooth. Cuticle between 3*a*–4*a* with longitudinal striae. Palp (trochanter to tarsus) 0-0-0-2-3(1ω). Legs I–IV setal counts: coxae 2-2-1-1; trochanters 1-1-2-1; femora 3-3-2-1; genua 0-0-0-0; tibiae 4-4-3-3; tarsi 7(1ω)-7(1ω)-3-3. Tarsi I–IV with tectal pair, *tc′* and *tc″*, absent. Ratio v_2/v_2–v_2: 0.7 ± 0.0 (0.6–0.8).

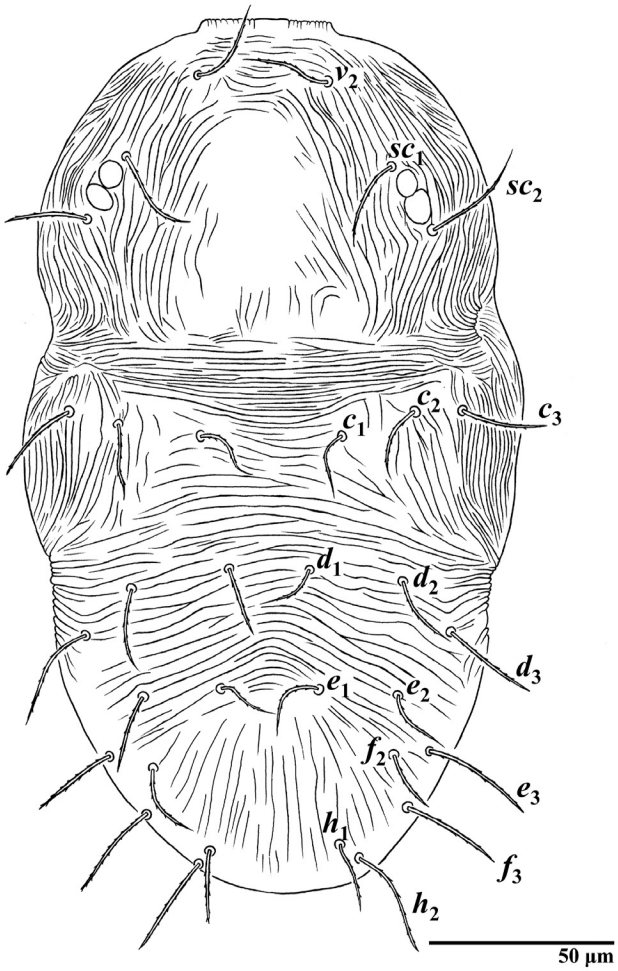

FIGURE 10. *Aegyptobia peruensis* **sp. nov.,** (Holotype, adult female). Dorsal habitus.

Description. Female (n=8):
(Figs. 9–14)

Body. Color in life carmine red; a pair of lateral eyes on each side of propodosoma; idiosoma oval in shape; length 250–305 [260].

Idiosomal dorsum. Idiosoma oval in shape, with striate sculpturing, and a total of 16 pairs of slender, linear, barbed setae (Figs. 9A, 10). Prodorsal shield with central region smooth, with weak longitudinal striae sublaterally becoming stronger laterally; anterior margin of prodorsal shield rounded without projection or notch; two pairs of eyes anterior to sc_2 setae, and three pairs of setae (v_2, sc_1 and sc_2); ratio v_2/v_2–v_2: 0.6–0.8 [0.8]. Opisthosomal shield with transverse striate sculpturing between c_1–e_1, striae increasingly arching towards posterior to e_1; with longitudinal sculpturing

between e_1–h_1 becoming oblique laterally (Figs. 10, 11A); cuticle between c_1 to c_2 often smoother or with fewer striae; cuticle lateral to c_2 with longitudinal striae becoming stronger laterally. Large pores apparently absent. Thirteen pairs of setae ($c_{1–3}$, $d_{1–3}$, $e_{1–3}$, $f_{2–3}$, $h_{1–2}$). Length of dorsal setae: v_2 22–25 [25], sc_1 25–26 [25], sc_2 26–30 [26], c_1 18–22 [18], c_2 20–21 [20], c_3 24–30 [24], d_1 18–20 [19], d_2 20–24 [22], d_3 28–30 [30], e_1 17–20 [17], e_2 19–22 [20], e_3 30–34 [30], f_2 20–22 [22], f_3 28–32 [28], h_1 18–21 [18], h_2 25–30 [27]. Distance between setae: v_2–v_2 32–35 [32], sc_1–sc_1 67–72 [67], sc_2–sc_2 85–100 [85], c_1–c_1 38–45 [38], c_2–c_2 78–95 [78], c_3–c_3 100–120 [100], d_1–d_1 21–24 [21], d_2–d_2 70–78 [70], d_3–d_3 93–100 [93], e_1–e_1 25–28 [26], e_2–e_2 66–74 [66], e_3–e_3 80–88 [80], f_2–f_2 60–65 [62], f_3–f_3 66–70 [66], h_1–h_1 30–35 [33], h_2–h_2 40–44 [40].

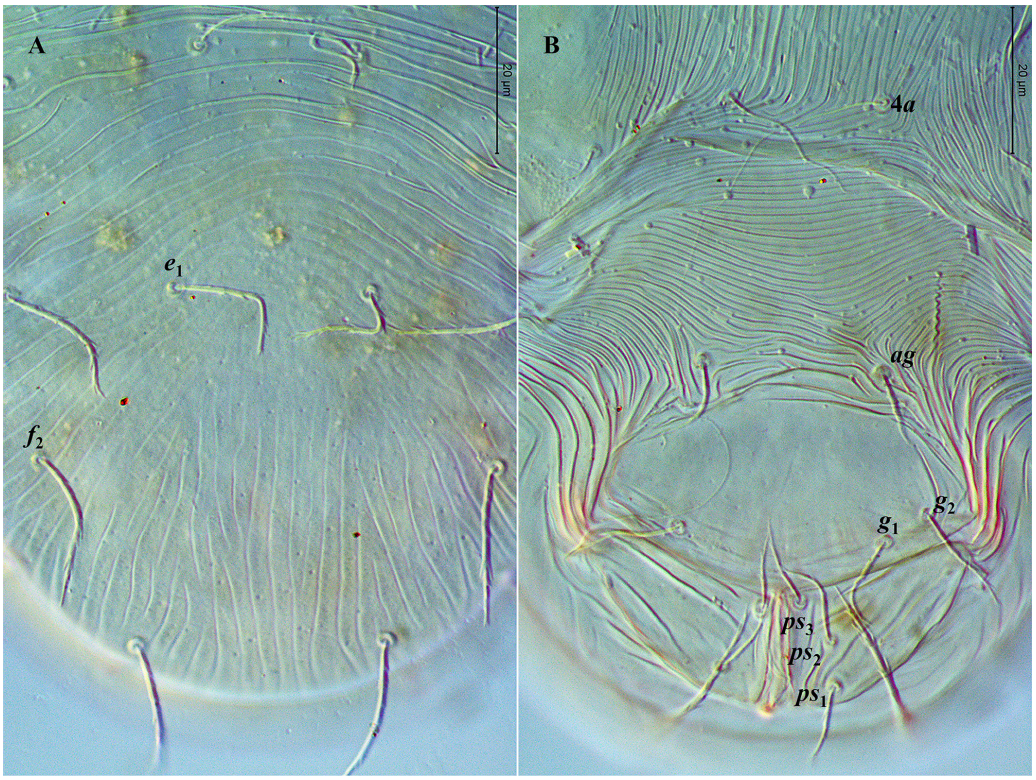

FIGURE 11. *Aegyptobia peruensis* **sp. nov.** adult female: **A**—posterior dorsal opisthosoma showing detail of striate pattern; **B**—posterior venter.

Gnathosoma. Ventral subcapitulum with a pair of short, slender and simple setae: *m* 5–6 [6]; distance between *m*–*m* 9–10[9]; with a pair of supracoxal setae *ep* on dorsal infracapitulum. Palp trochanter, femur, genu without setae; palp tibia with two tactile setae (*d*, *l″*); palp tarsus with three phaneres - two eupathidia (*ul′* and *ul″*) and one solenidion (*ω*).

Idiosomal venter. Cuticle between setae 1*b* to 1*a* with very fine longitudinal striae (can be indistinct); cuticle between setae 1*a*–3*a* with transverse striae; area between 3*a*–4*a* with strong longitudinal striations; 4*a* to *ag* with transverse striations becoming oblique laterally (Figs. 9B, 11B, 12). Genital plate smooth. Genital setae $g_{1–2}$ inserted along posterior margin of plate. Pseudoanal setae ps_3 inserted in anteriomedial corners of anal plates, with ps_{1-2} inserted off medial margins in longitudinal row; plates with oblique striae (Figs. 11B, 12). All ventral setae simple and apparently smooth except 2*c*, *ag*, g_{1-2}, and ps_{1-3} barbed. Ratio 4*a*/*ag*: 2.1–3.0 [2.4]. Length of ventral setae: 1*a*

30–32 [30], 3*a* 8–10 [10], 4*a* 22–45 [22], *ag* 15–18 [16], g_1 15–20 [15], g_2 18–22 [18], ps_1 12–15 [12], ps_2 12–15 [12], ps_3 10–13 [10]. Distance between setae: 1*a*–1*a* 22–25 [22], 3*a*–3*a* 40–49 [40], 4*a*–4*a* 26–30 [26], *ag*–*ag* 25–31 [25], g_1–g_1 20–25 [23], g_2– g_2 35–40 [36].

Spermatheca (Fig. 12). Spermathecal tube narrow, sclerotized basally, membranous distally, termination not discernible.

Leg phanerotaxy. Legs I–IV short (Figs. 13A–D). Seta *l′* on tr III long, barbed; unguinal setae *u′*–*u″* fine with few short barbs. Supracoxal setae *e*I. Number of setae on leg segments, with solenidia (on tarsi) given in parentheses and included in setal counts: coxae 2-2-1-1; trochanters 1-1-2-1; femora 3-3-2-1; genua 0-0-0-0; tibiae 4-4-3-3; tarsi 7(1ω)-7(1ω)-3-3. Tectal pair, *tc′* and *tc″*, absent on tarsi I–IV. All apoteles terminate in two uncinate claws and a pad-like empodium, each with tenant hairs. Solenidion *ω″* on ta I 7–8 [8] and ta II 6–7 [6].

Etymology. The specific epithet "*peruensis*" is derived from the country of origin, Peru.

Distribution. Peru, Department of Piura, north-western region, campus of the UNP.

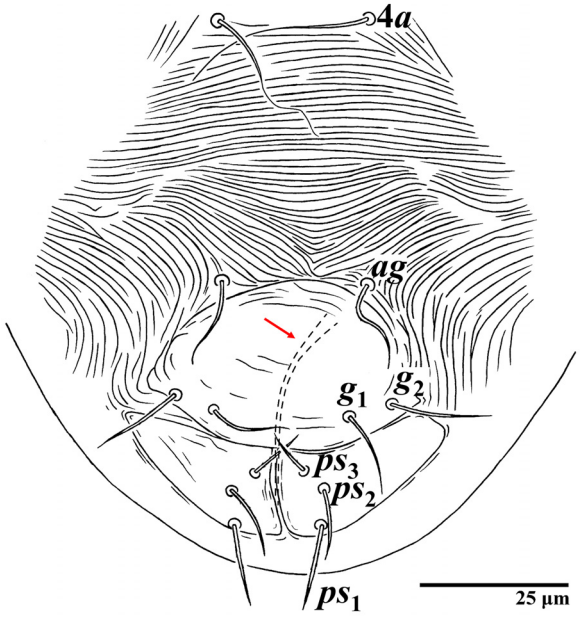

FIGURE 12. *Aegyptobia peruensis* **sp. nov.** adult female posterior venter; red arrow indicating duct of spermatheca.

Differential diagnosis

The closest region to Peru where *Aegyptobia* has been recorded is Mexico, with 19 species. Three Mexican species have been recorded from Fabaceae and/or related host plants (as discussed in Introduction)—*A. cassiae* Baker & Tuttle, *A. pennatulae*, and *A. vannus* Pritchard & Baker.

Based on descriptions only, *A. peruensis* **sp. nov.** (*Aper*) can be easily distinguished from *A. cassiae* (*Acas*) using the dorsal sculpture pattern—*Aper* has striate sculpture (prodorsum mostly longitudinal, opisthosma mostly transverse) compared with *Acas* which has regular, areolate-rugose sculpture; from *A. pennatulae* (*Apen*) using the dorsal sculpturing and shape of dorsal setae—*Aper* with lineate striate cuticle and slender, linear, barbed setae, compared to *Apen* with a patchwork of narrow parallel corrugations and elongate obovate setae; and from *A. vannus* (*Avan*) using the shape of the dorsal setae—*Aper* with slender, linear, barbed setae compared to *Avan* with distinctly orbicular dorsal setae.

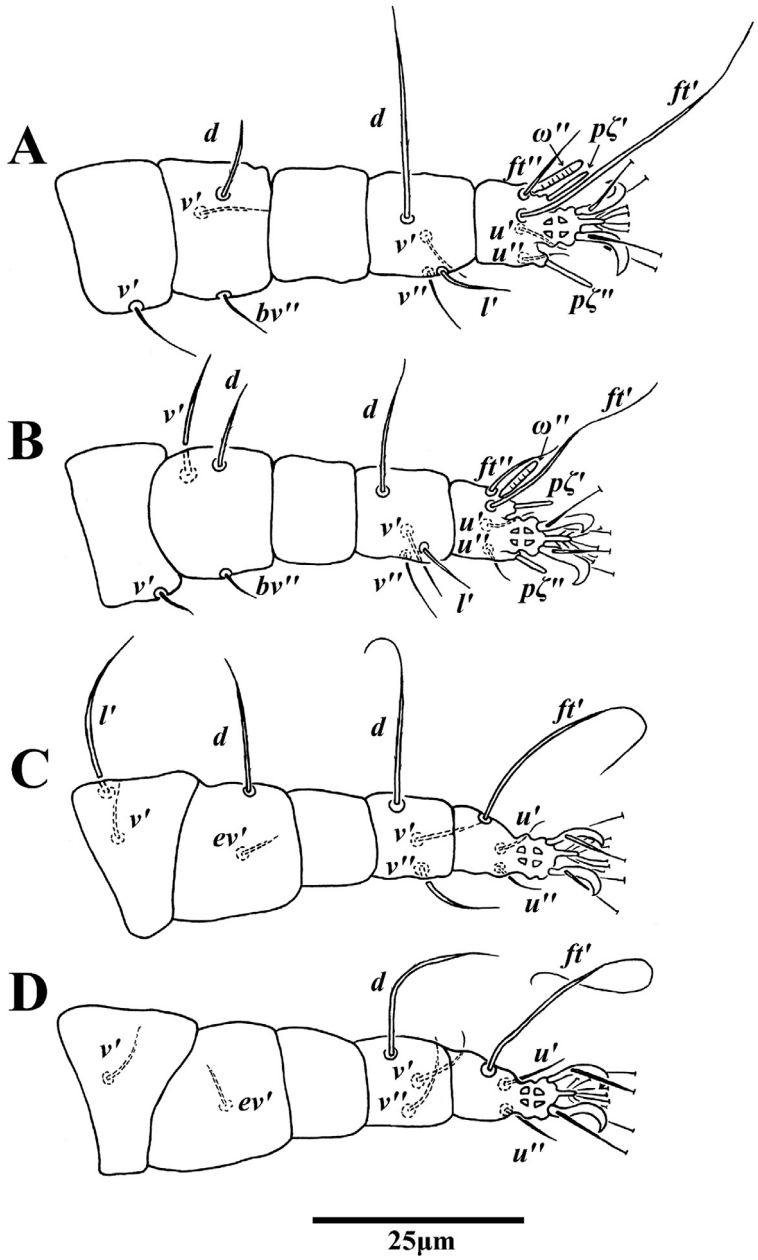

FIGURE 13. *Aegyptobia peruensis* **sp. nov.** adult female, detail of left legs: **A—**leg I; **B**—leg II; **C**—leg III; **D**—leg IV.

Further afield, there are three species collected in Arizona, USA, that all share a similar striate dorsal sculpturing with *A. peruensis* **sp. nov.**—*A. acacia* Baker & Tuttle (*Aaca*) from *Acacia* (Mimosaceae), *A. eriogonum Baker* & Tuttle (*Aeri*) from Polygonaceae, and *A. fallugia* Baker & Tuttle (*Afal*) from Rosaceae. Based on descriptions available in the literature, *Aper* is most similar to *Aeri*, but can be separated based on the number of setae on genua I–II—*Aper* ge I–II without setae compared with *Aeri* ge I–II with 1 seta. *Aper* can be separated from *Aaca* using dorsal sculpturing and setae on genua I–II: *Aper* with transverse striae between setae c_1 and d_1 and ge I–II are without

setae, while *Aaca* is distinctly smooth between setae c_1 and d_1 with a narrow band of transverse striae just anterior to the D row (which Baker & Tuttle 1972) point out is reminiscent of the dorsal morphology generally seen on male tenuipalpids), and ge I–II have setae. *Aper* can be separated from *Afal* using dorsal sculpturing—*Aper* with transverse striae from c_1 to e_1, while *Afal* has longitudinal striae centrally between c_1 and d_1.

Outside of the Americas, *Aegyptobia peruensis* **sp. nov.** shares striate dorsal sculpturing with *A. nummulus* Chaudhri 1972 (*Anum*) from Cupressaceae in Pakistan, but *Aper* can be separated by having uncinate claws (*tragardhi* species group) and the palp femur without setae, while *Anum* has pad-like claws (*macswaini* species group) and one seta on the palp femur.

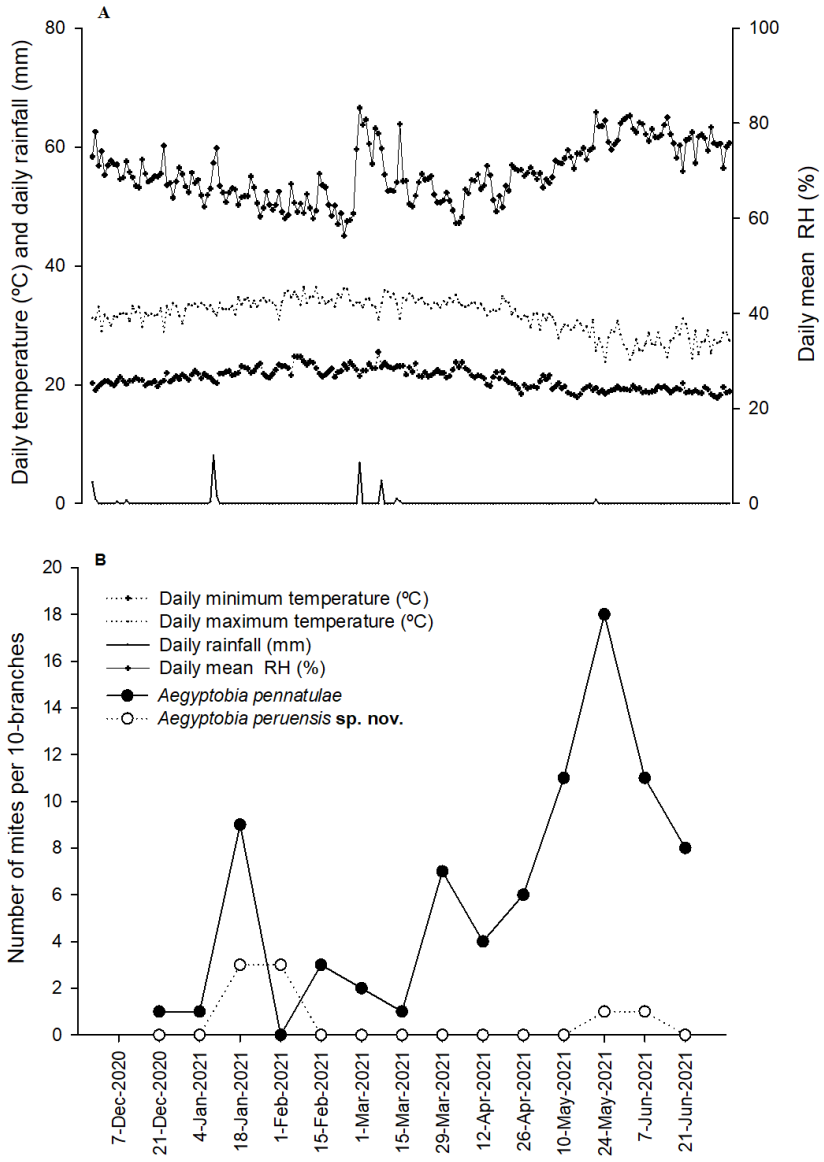

FIGURE 14. Climatic and population data: A—climatic variation data; B—population fluctuation of *Aegyptobia* spp. on branches of host tree algorrobo *Neltuma piurensis* (Fabaceae).

Ecological information

Aegyptobia pennatulae and *A. peruensis* **sp. nov.** were sampled and observed during the summer (January–February) and autumn seasons (May–June). The former species was encountered more frequently during the periods of flowering and subsequent fruit development in summer, and populations were negatively affected during periods of precipitation (Fig. 14). Females and immatures were often observed resting or potentially feeding in the cracks and divots in the bark of the host plant (Fig. 8). Irregularly ovoid red eggs were laid in protected areas such as depressions and split bark (Fig. 8C). In contrast, only female *A. peruensis* **sp. nov.** were observed and collected during this study, and in much lower numbers than *A. pennatulae* (Fig. 14). The lack of immatures may indicate that this host-plant association is accidental.

The environmental conditions during the autumn season were as follows: minimum temperatures ranged from 18.9 to 22.3°C, maximum temperatures 27.0 to 33.8°C, and the relative humidity ranged from 65.1 to 79.6%.

Acknowledgments

Special thanks to Francisco Ferragut Perez, of the Mediterranean Agroforestry Institute (IAM), for Figure 9, identification, and confirmation of mite species. We want to express our thanks to the Universidad de Piura (UDEP-Peru) for the information on the meteorological data of the MetRadarUdep1 station. This work was supported by the Fundação de Amparo à Pesquisa do Estado de São Paulo (FAPESP) (Procs. 2021/06373-0 and 2024/00175-0) by fellowship to the third author. We wish to express our special thanks to Andrew Ulsamer (ARS-USDA) for the revision and suggestions to the manuscript. To the Smithsonian Natural History Museum (NMNH) and National Agricultural Library (NAL-USDA), SEL-USDA for support and assistance with specimens and references. Mention of trade names or commercial products in this publication is solely for the purpose of providing specific information and does not imply recommendation or endorsement by the USDA. USDA is an equal opportunity provider and employer.

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Submitted: 15 Aug. 2024; accepted by Zhi-Qiang Zhang: 14 Oct. 2024; published: 29 Nov. 2024