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A new species of *Wyeomyia (Hystatomyia*) (Diptera: Culicidae) from Colombia and a redescription of *Wy. (Hystatomyia) intonca* Dyar & Knab

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Abstract

Species within the *Wyeomyia* subgenus *Hystatomyia* represent one of the dominant mosquito groups utilizing tank bromeliads as larval development sites in mangrove and adjacent forest habitats on the northern Pacific Coast of Colombia. Surveys of phytotelm plants in this region found larval stages of *Wy. intonca* Dyar & Knab frequently associated with large tank bromeliads, especially of the genus *Werauhia*, growing in mangrove. *Wyeomyia intonca* was originally described in 1910 on the basis of a male from the Canal Zone, Panama, and the larval stage was partial described in the 1920s. These incomplete descriptions have led to confusion over its identity and differentiation from *Wy. circumcincta* Dyar & Knab. Consequently, *Wy. intonca* is redescribed here. In addition, *Wy. chocoensis* sp.n. is described from specimens reared from tank bromeliads in the same region where *Wy. intonca* occurred. The descriptions of these two species, accompanied with relevant illustrations, are of adult males and females and of the pupal and larval stages.

Key words: Diptera, Culicidae, *Wyeomyia*, *Hystatomyia*, new species, bromeliads, Colombia

Introduction

The two descriptions presented here, one of a previously described species and the other of a newly recognized species, emanated from field studies of mosquitoes associated with phytotelm plants in mangrove and lowland forest on the northern Pacific Coast of Colombia. From a phylogenetic perspective, both species are members of the subgenus *Hystatomyia* of *Wyeomyia*. *Hystatomyia* was first established as a genus by Dyar (1919) with *Wy. circumcincta* Dyar & Knab as the type species and with two additional species, *Wy.*

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intonca Dyar & Knab and *Wy. coenonus* Howard, Dyar & Knab. This genus was differentiated from other sabethine genera on the basis of distinguishing characteristics of the male genitalia, especially the subapical position of the gonostylus. *Hystatomyia* was placed as a subgenus of *Wyeomyia* by Dyar in 1923, as a subgenus of *Prosopolepis* by Dyar in 1924, and as a subgenus of *Dendromyia* by Dyar in 1928. Edwards (1932) removed *Hystatomyia* as a subgenus combining its species with those of several other subgenera into the subgenus *Dendromyia*. In 1998 Judd resurrected *Hystatomyia* as a subgenus of *Wyeomyia*. Two distinct phylogenetic lineages are apparent under the present concept of the subgenus *Hystatomyia*—one comprised of species indigenous to Meso-America and humid lowlands west of the Andes (*Wy. circumcincta, Wy. coenonus, Wy intonca,* and *Wy esmeraldasi* [Levi-Castillo 1955]), and the other of species from the Amazon basin (*Wy. autocratica* Dyar & Knab, *Wy. lamellata* [Bonne-Wepster & Bonne], and *Wy. lopezii* Cova Garcia, Sutil Oramas & Pulido).

In 1998 Judd redescribed *Wy. circumcincta* and removed *Wy. intonca* from synonymy with that species. Although quite distinctive, *Wy. intonca* often has been confused with *Wy. circumcincta*. This perhaps can be attributed to similarities between these two species with regard to the larval stage and females as well as to Dyar's failure to adequately illustrate the gonostylus of the male genitalia. We frequently encountered *Wy. intonca* in collections from certain bromeliads in northern Colombia, and consequently, sufficient specimens were obtained to permit the present redescription of the species.

The original description of *Wy. intonca* by Dyar and Knab (1910[1909]) is based on a single male from Empire, Canal Zone, Panama. Although brief, several salient characters, especially related to the midtarsi and genitalia, are described. A brief description of the larva was published by Dyar in 1926 and again in 1928, with the latter including illustrations of the head and terminal segments. However, the 1928 larval description of *Wy. intonca* is identical to accompanying larval descriptions of *Wy. circumcincta* and *Wy. coenonus*. The illustration of the terminal abdominal segments is informative but the head is of an unrelated species. Dyar published illustrations of the male genitalia of *Wy. intonca* in 1919 and 1928; however, failed in both instances to accurately illustrate the gonostylus. *Wyeomyia intonca* was synonymized with *Wy. circumcincta* by Lane (1945, 1953) after tentatively being equated to this species by Lane & Cerqueira (1942). As noted above, Judd (1998) resurrected *Wy. intonca* from synonymy on the basis of differences "in larval chaetotaxy and the shape of the male gonostylus." The present redescription of *Wy. intonca*, which includes descriptions of the adult male and female, the fourth larval stage, and the previously undescribed pupal stage, validates its species-level status. In addition, the present paper includes a description, based on larval, pupal and adult stages, of a previously unrecognized species, which clearly belongs to the subgenus *Hystatomyia* but is not closely allied with any of the presently described species.

Material and methods

The descriptions are based primarily on specimens collected as larvae from bromeliads, many of which were subsequently reared to the adult stage. With exception of observations on adults related to color and distribution of scales and color of setae, descriptions are based on specimens mounted in Euparal on microscope slides following procedures described by Pecor and Gaffigan (1997). Microscope slide mounted specimens were examined using both bright field and phase contrast microscopy, and pinned (pointed) adults were observed under simulated natural light. The terminology used to describe morphological characters and the numbering system for chaetotaxy is that recommended by Harbach and Knight (1980). Most measurements and numbers are from at least 8 specimens (16 setae). While the number of branches possessed by most setae is readily apparent, branching on a few setae is difficult to evaluate. An example is abdominal seta 11 of the larva, which is minute in some species and ventral in position. Life stages are represented by the following symbols A, adult; ♂, male; ♀, female; L, fourth-instar larva; Le, fourth-instar larval exuviae; P, pupa; Pe, pupal exuviae. The letter G designates genitalia and is used in combination with the sex symbols.

The holotype and several paratypes of the new species described here, as well as representative specimens of *Wy. intonca*, will be deposited in the National Museum of Natural History, Smithsonian Institution, Washington, DC. Paratypes and representative specimens also are located in the insect collection of the Universidad de Antioquia, Medellín, Colombia.

Wyeomyia (Hystatomyia) chocoensis Porter & Wolff, sp.n.

(Figs. 1, 2, 5, 6)

MALE. *Head*: Vertex and adjoining lateral surface of head with broad, dark decumbent scales with bronze and blue-green iridescence; no erect scales present; patch of white scales occurs basolaterally; scales along ocular line white or with at least their distal margin white resulting in distinct white line along edge of compound eye. Ocular setae dark brown, including 2 long approximated interocular setae. Interocular space without scales, narrows to width equal to or slightly less than that of single ommatidium. Clypeus and frons without setae or scales; frons with dense covering of fine aculeae (pubescence) between postfrontal suture and antennal socket; clypeus with less dense covering of minute aculeae. Palpus two-segmented (0.16–0.19 mm, mean 0.18, *n* 6); segment 1 short, rather quadrate; segment 2 elongate; both covered with dark scales. Proboscis slightly expanded in distal 0.3; dorsal surface with dark scales with blue-green iridescence; ventral surface primarily with pale and white scales extending from base to about 0.7 length where they merge with prominent preapical patch of bright white scales at beginning of apical expansion; white scales end at about 0.8, replaced by dark scales to distal end. Proboscis

(P) (1.46–1.55 mm, *n* 3) longer than antennae (flagellum [F] 1.27–1.34 mm, mean 1.31, *n* 4), mean P:F 1.13 (*n* 3), but shorter than forefemur (Fe-I), mean P:Fe-I 0.74 (*n* 3). Pedicel with 6 small setae dorsomesad. Flagellum moderately verticillate, whorls with 8–11 setae, longest setae about 0.35 flagellum length; flagellomere 1 with dorsomesad cluster of 7–12 scales; length of selected flagellomeres (Flm) derived from 3 specimens (6 antennae) as follows: Flm_5 0.08–0.09 mm, Flm_{11} 0.10–0.12 mm, Flm_{12} 0.12–0.15 mm, Flm_{13} all 0.19 mm; mean Flm_{13}:Flm_5 2.31. Distal 2 flagellomeres not disproportionately longer than preceding flagellomeres. *Thorax*: Integument primarily light brown. Scutum with broad dark scales with bronze and blue-green iridescence, anterior promontary region with a few white scales and about 9 dark brown setae, no acrostichal or dorsocentral setae present. Supraalar and antealar areas have combined sum of 25–31 (mean 28, *n* 3) dark brown setae. Scutellum covered with broad scales concolorous with those of scutum, margin of median lobe with 4 large and about 3 small dark brown setae, lateral lobes with 4 large and 4 or 5 small dark brown setae. Mesopostnotum brown with medial cluster of 8–11 brown setae. Antepronotal lobes widely separated dorsally, with dark scales dorsally and silvery white scales on portion adjoining pleura; each lobe with 7–12 dark brown setae. Postpronotum without setae; covered primarily with silvery white scales, those along dorsal margin concolorous with scales of scutum. Pleuron with silvery white scales although anterior half of mesokatepisternum and posterior one-third of mesanepimeron bare. Paratergite, meron, and metapleuron entirely bare. Pleural chaetotaxy as follows: prespiracular, 1 dark seta; postspiracular setae absent; upper proepisternal, 2–4 yellow setae; lower mesokatepisternal, 4–7 yellow setae; upper mesokatepisternal setae absent; prealar, 3–4 dark, occasionally pale, setae; lower mesepimeral setae absent; upper mesepimeral, 6–9 yellow setae. *Legs*: forecoxa with silvery white scales on anterior margin, otherwise bare; midcoxa and hindcoxa with silvery white scales. Trochanters primarily with silvery white scales although few on dorsal surface, small dark scales on upper distal margin of midtrochanter and hindtrochanter, scattered dark scales on upper surface of foretrochanter. Dorsal surface of femora with dark scales with bronze reflection and dark blue and greenish-blue iridescence depending upon angle of incident light. Posteroventral surface of forefemur covered with white scales over basal 0.3; white scaling gradually decreases to narrow posteroventral line at about 0.5, which extends distally and becomes slightly broader near distal end. Ventral surface of midfemur and hindfemur with white scaling over entire length. Forefemur slightly longer than foretibia (Ti-I) (mean Fe-I:Ti-I 1.08, *n* 3); forefemur somewhat shorter than midfemur (Fe-II) (mean Fe-I:Fe-II 0.87, *n* 3) but longer than hindfemur (Fe-III) (mean Fe-I:Fe-III 1.27, *n* 3); forefemur longer than proboscis (mean Fe-I:P 1.36, *n* 3). Dorsal surface of foretibia and foretarsomere 1 (Ta-I_1) concolorous with forefemur; scales on dorsal surface of Ta-$I_{2–5}$ dark, appearing dark blue at certain angles of incident light; foretibia with white scaling on posteroventral surface, diminished distally, seldom reaching distal end; ventral surface of Ta-I_{1-5} primarily with dark scales with metallic reflection; ungues equal, simple, dark but pale basally. Midfemur

distinctly longer than midtibia (Ti-II) (mean Fe-II:Ti-II 1.56, *n* 3), dorsal surface of midtibia, and midtarsomere 1 (Ta-II_1) concolorous with midfemur, posteroventral surface of midtibia and Ta-II_1 with broad white scaling over entire length. Midtarsomere 2 (Ta-II_2) entirely white scaled with exception of some grey to dark scales basally on anteroventral surface, seldom extending beyond 0.3 length of tarsomere; Ta-$II_{3–5}$ completely white scaled except for a few grey to dark scales at distal end of Ta-II_5. Ungues dissimilar; larger unguis stout, dark, curved to almost 90° angle, tip blunt, rounded; smaller unguis simple, dark. Hindfemur slightly longer than hindtibia (Ti-III) (mean Fe-III:Ti-III 1.05, *n* 3), hindtarsomere 1 (Ta-III_1) somewhat longer than hindfemur (mean Ta-III_1:Fe-III 1.13, *n* 3). Dorsal surface of hindtibia and Ta-$III_{1\&2}$ concolorous with hindfemur, dorsal surface of Ta-$III_{3–5}$ with dark scales with metallic reflection. Ventral surface of hindtibia with white scales limited to about basal 0.1, remainder primarily with pale scales with metallic reflection; ventral surface of Ta-III_1 with a few pale scales basally but predominately with dark scales having metallic reflection; ventral surface of Ta-III_2 with predominately pale scaling; ventral surface of Ta-$III_{3–5}$ with dark scales having metallic reflection. Ungues unequal; longer unguis very slender (0.07–0.08 mm) with fine tip, about 2x length of shorter; both curved distally. Halteres with scabellum and pedicel pale (cream-colored), distal portion of pedicel and capitellum covered with dark scales with bronze and blue-green iridescence. *Wing*: 2.10–2.40 mm, wing scales mostly decumbent and concolorous with scutum. Dorsal scales primarily spatulate, rather broad with rounded ends; R_2, R_3, R_{4+5}, M_1, and M_2 with typical broad spatulate scales over entire length. In addition to broad spatulate scales, R_1 has a row of smaller spatulate scales closely appressed to vein; 1A with somewhat narrower spatulate scales, which are closely appressed to vein and extend over almost entire length of vein before ending near wing margin. Sparse row of relatively narrow scales (plume scales) occurs on dorsal surface of M and radial sector (Rs). Ventral wing scales similar to dorsal scales but with plume scales on following veins: M_{3+4} except near distal end, distal 0.5–0.6 of CuA, and a few on basal 0.5 of R_{4+5} and basal ~0.5 of R_1. Also, plume scales may be present on distal third of 1A. CuA and 1A without spatulate scales on ventral surface, thus only with distal plume scales. Ventral scales of M all spatulate. Vein R_2 about 4–5 times longer than vein R_{2+3}; vein 1A ends somewhat before junction of mcu and CuA. Alula with 9 or 10 piliform setae. *Abdomen*: Abdominal terga primarily with dark scales similar in color to those of scutum; lateral margins with silvery white scales, which form an essentially straight line along abdomen; pale scales expand dorsally somewhat on tergum VII; sterna covered with silvery white scales. Tergum I covered with dark scales dorsally, lateral margins bare; diffuse group of about 20–25 prominent, amber-colored setae occur laterally on either side of meson. Laterotergite without scales. Distal margin of terga II–V with about 7–14 small pale setae; these setae more numerous along distal margin of terga VI and VII (~ 22); lateral margins of terga II–VI usually with 1–4 small pale setae. Distal margin of sterna II–V with about

10–20 small pale setae; distal margin of sterna VI and VII (~23) with more numerous and somewhat longer setae; sternum VII also with 2 or 3 setae medially and slightly basal to distal margin; lateral margins of sterna III–VII usually with 3–6 small pale setae. Tergum VIII and sternum VIII are included in description of genitalia. *Genitalia* (Fig. 1C–G): Tergum VIII (ventral in position) narrow, 2.8–3.3x as wide as long; covered with small spicules, which become minute and very numerous basally although basal 0.2–0.4 glabrous; distal margin somewhat concave; spatulate scales primarily along lateral margins. Tergum VIII with 72–90 (mean 78, *n* 6) relatively long setae with curved tips, longest about 1.4x length of tergum VIII along median plane; setae located along and near distal margin but most numerous in mesal region where their presence is somewhat expanded basally to about 0.5 length of tergum VIII; a pair of tiny setae located about 0.33 from basal margin and laterad of median plane. Sternum VIII (dorsal in position) 2.0–2.5x as wide as long; distal margin somewhat convex; covered with small spicules, which become minute and very numerous basally although about basal 0.3 glabrous. Sternum VIII also covered with dark, decumbent spatulate scales and with 17–24 (mean 21, *n* 6) setae arranged primarily as single row along distal margin, longest setae similar in length to those on tergum VIII; pair of minute setae or punctures located sublaterad and about 0.4 from basal margin. Tergum and sternum IX fused laterally forming complete ring. Tergum IX bearing 3 or 4 stout but relatively short setae on either side of narrow median bridge, apices of setae bent slightly laterad. Sternum IX narrow but with medial triangular-shaped expansion between base of gonocoxites; outer surface densely spiculate. Gonocoxite spiculate; elongate, expanded basally, distal 0.5 slender and slightly bowed; sternal surface with scattered setae; lateral margin from near base to apex with scales and scattered setae; long, recurved, yellowish setae along mesal margin of slender distal portion of gonocoxite from slightly above base of gonostylus to near apex; apex with dense cluster of long, slightly lanceolate, dark setae (about 0.4 length of gonocoxite). Three tergal setal groups: (1) proximal mesal group comprised of a dense cluster (golden in color) of 25–30 (mean 28, *n* 8) lanceolate setae (about 0.4 length of gonocoxite), most curved beyond mid-length; (2) a tight group of 9–15 (mean 12, *n* 8) slender, pale setae (similar in length to lanceolate setae) at distal edge of lanceolate setal cluster; (3) slightly laterad of lanceolate setal cluster is a diffuse group of 13–17 (mean 16, *n* 9) very slender dark setae, curved near tip. Gonostylus (Fig. 1D) about 0.4 length of gonocoxite, arises on mesal surface of gonocoxite near mid-length, curved toward distal direction at about 0.3 length; glabrous but rugose near apex; broad over entire length but with short, acute tip. Aedeagus longer than wide; submedian tergal arms bend toward each other resembling an upside-down V, narrowly joined at midline to form a tergal bridge; apical tergal arms flared laterally and joined apically to form narrow apical tergal bridge (ATB), posterior margin of ATB minutely crenulate; median sternal plate located within apical tergal arms, apical portion coarsely denticulate. Proctiger (in lateral view) with broad basal sclerotization of tergum X, paraproct rounded apically with adjacent subapical lobe and with 4 or 5 cercal setae.

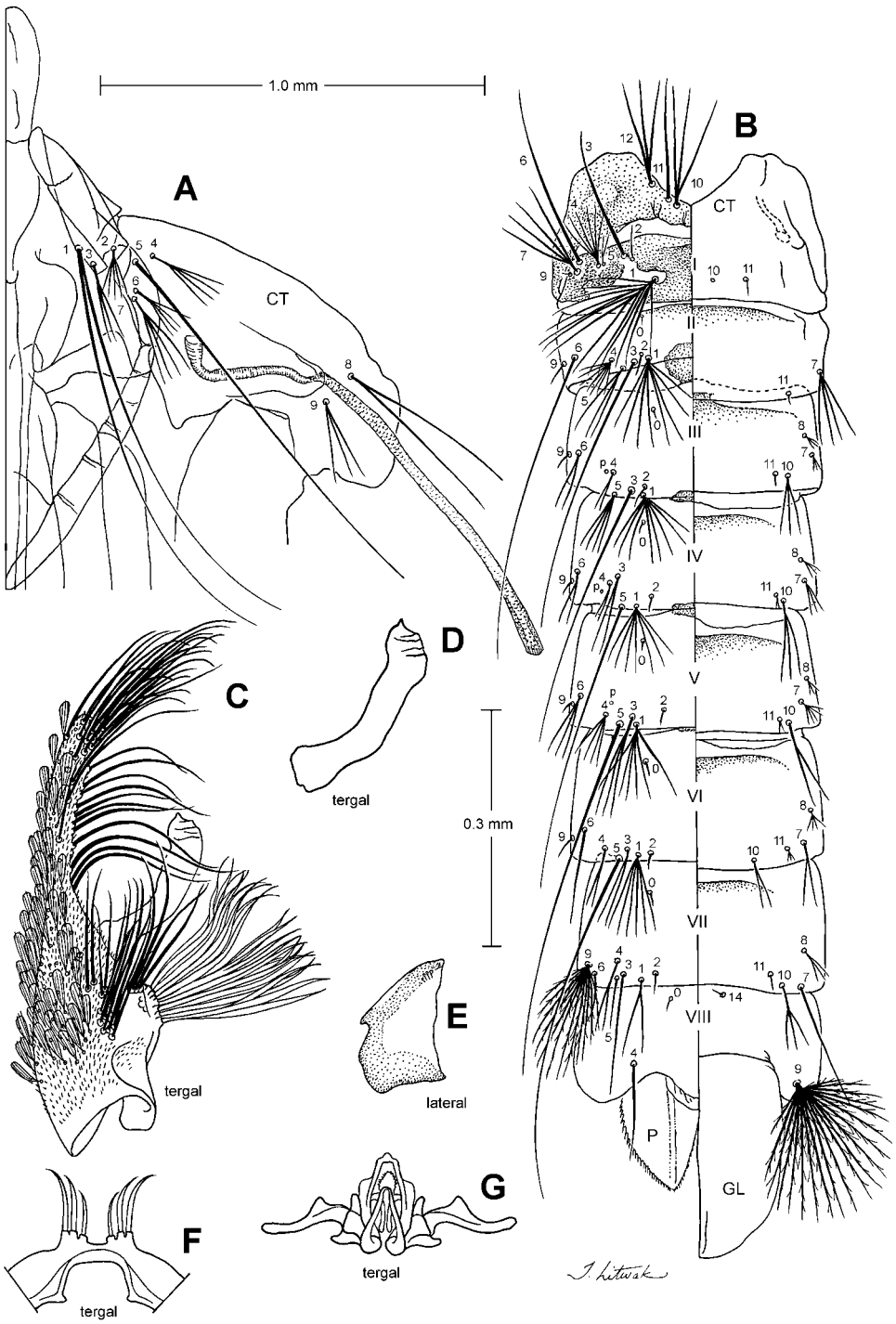

FIGURE 1. Pupa and male genitalia of *Wyeomyia chocoensis*. A, B, Pupa: (A) left side of cephalothorax, dorsal to right; (B) dorsal (left) and ventral (right) aspects of metathorax and abdomen, dorsal color pattern not illustrated for abdominal segments II-VIII. C–G, Male genitalia, aspects as indicated: (C) gonocoxite; (D) gonostylus; (E) proctiger (left side); (F) tergum 1X; (G) aedeagus, with parameres and basal pieces attached.

FEMALE. Like male except for sexual characters as follows. *Head*: Proboscis slightly expanded in distal 0.3, ventral surface with white scales from base to slightly beyond 0.7 length of proboscis (ending near base of apical expansion), about distal 0.3 of proboscis with dark scales. *Thorax:* Integument tan to light brown. *Legs*: Posteroventral surface of forefemur with white scaling over basal ~0.3, rather narrow line of white scales continues to distal end. Posteroventral surface of foretibia with white scales over entire length or to 0.7 and with scattered white scales to distal end. Foretarsomeres 1–5 (Ta-$I_{1–5}$) with dark scaling, scales on posteroventral surface with bright metallic reflection. Foretarsomere 1 (Ta-I_1) often with a few white scales basally. Midfemur and midtibia with white scales over entire length on posteroventral surface, although white scales may become scattered or absent toward distal end of midtibia. Dorsal surface of midtarsomere 1 (Ta-II_1) primarily dark scaled with a few white scales at distal end; in some specimens, narrow irregular row of white scales extends over entire anterodorsal surface. Posteroventral surface of Ta-II_1 with metallic reflection; white scales limited primarily to basal 0.3 but scattered white and pale scales extend to distal end. Dorsal surface of Ta-II_2 (Fig. 6B) with white scaling, which gradually expands distally to anterior and posterior surfaces; ventral surface with dark scales with metallic reflection. midtarsomeres 3–5 (Ta-$II_{3–5}$) primarily with white scales, dark scales limited to ventral surface; Ta-II_5 with a few dark scales dorsally at distal end. Ventral surface of hindfemur with white scales over entire length. Ventral surface of hindtibia primarily with dark scales, some specimens have white scales on basal 0.2. Dorsal surface of hindtarsomeres 1–5 (Ta-$III_{1–5}$) with dark scaling and metallic or blue iridescence depending upon angle of light. Presence of white scales on ventral surface of Ta-III_1 variable; a few scattered white scales may be present or white scales may extend as line to about 0.6. Scales on ventral surface of Ta-$III_{2–5}$ pale to dark with bright metallic reflection. *Genitalia* (Fig. 5E-H): Tergum VIII wider than long (width 0.41 mm, length along median plane 0.17 mm), covered with minute spicules and spatulate scales, lateral margins rounded, distal margin somewhat convex. Setae primarily limited to distal 0.33 of tergum VIII, most numerous near distal margin, extending somewhat basally on median plane, in total about 38–47 setae; many setae near distal margin quite long, some slightly exceeding length of tergum VIII; interspersed among long setae are short setae about 0.20–0.25 length of long setae; pair of tiny setae situated sublaterally near basal margin. Sternum VIII wider than long (width 0.37–0.43 mm, length along median plane 0.11–0.12 mm), covered with minute spicules and spatulate scales; distal margin broadly concave with numerous strong setae, which expand posteriorly to form broad V-shaped cluster over median plane, in total about 52–53 setae; length of many setae similar to that of sternum VIII (0.12 mm) although longest nearly twice that length; lateral margins with very few scales or setae; pair of tiny setae located sublaterally near basal margin. Tergum IX narrow (width 0.21–0.22 mm, length 0.03 mm), covered with small spicules, distal margin slightly convex with slight emargination at center, 1 or 2 prominent setae on either side of midline. Insula wider than long, covered with moderately long spicules, apex

rounded, about 12 small setae near distal margin, basomesal semicircular depression present with spicules along lateral edges. Postgenital lobe similar in length to cerci, covered with minute spicules, apex slightly emarginate at center, ventral surface with numerous short setae over distal 0.6, dorsal surface with about 7 longer setae on either side of midline; dorsal postgenital lobe length 0.09 mm, dorsal postgenital lobe index 1.85–2.00 (see Reinert, 1974). Cercus rather flat, covered with minute spicules, apex rounded to somewhat truncate; dorsal surface with about 10–13 setae, longest 0.7–0.8 length of dorsal postgenital lobe. Three spherical spermathecal capsules, all somewhat different in diameter.

PUPA (Fig. 1A,B). Position and character of setae as figured; numbers of branches presented in Table 1. Overall color pattern of pupal exuviae remains similar among different individuals but variation occurs in intensity of pigmentation. *Cephalothorax (CT)*: Tan with very pale to clear patches. Most notable pale areas on scutum include small spot at base of trumpet, two pale areas adjacent to antenna, and pale areas along dorsal margin of scutal protrusion associated with base of trumpet. Seta 1-CT strongly developed, long, double, often slightly bent or curved submedially or medially; 4-CT usually with 2 or 3 branches; 5-CT strongly developed, long, single. Mesothoracic wing mottled basally with 2 distinct pale areas, very pale distally. Metathoracic wing tan but mottled with pale areas; distinct clear spot on each lateral margin; narrow portion of metathoracic wing beyond pale spot (adjacent to lateral margin of abdominal segment I) quite darkly pigmented. *Trumpet*: Tan, darker basally and near distal end, medial portion very pale (almost white), distal end slightly flared and paler at tip (length 0.80–1.06 mm, mean 0.93 mm, *n* 8). *Abdomen*: Coloration varies from very light to dark tan. Abdominal tergum I mottled with pale spots corresponding to positions of seta 3-I, 4-I, and 6,7-I. Pale spot associated with seta 6,7-I large, often very prominent. Abdominal sternum I frequently with submesal puncture. Abdominal tergum II dark tan with pale areas/spots laterally and distally; seta 2,3-II within distal submesal pale area and seta 1,5-II at distal edge of this pale area; seta 4-II within pale spot and seta 6-II within extensive lateral pale area. Abdominal tergum III similar in pigmentation to abdominal tergum II but with distinct submesal pale area, which extends to distal margin, seta 1–3-III within this pale area; seta 4-III within pale spot; seta 6-III within extensive lateral pale area. Areas of darker coloration, most prominent as mesal and submesal longitudinal lines, are progressively diminished from abdominal terga IV to VII. Abdominal terga II–V with sublateral pale area separated by narrow dark line from relatively broad pale area along lateral margin. Abdominal tergum VIII tan but with basomesal region darker. Seta 1-I usually with 13–17 branches, 1-II–VI prominent, multibranched; seta 2-II very small, basal or basolateral to 1-II, 2-III–VII very small, basomesal or mesal to 1-III–VII; seta 3-I rather strong, usually single, 3-II,III single, long (approx. 0.8 mm), 3-IV–VI about 0.3 length of 3-III, 3-IV,VI usually 2-branched, 3-V usually with 3 or 4 branches; seta 5-I double, infrequently triple; seta 5-II,III relatively small (approx. 0.2 mm), 5-II 3-branched, less frequently 2- or 4-branched, 5-III with 3 or 4 branches, 5-

IV–VI single, very long (approx. 1.0–1.1 mm). A puncture, situated near seta 4 on abdominal segments III–V, is usually located distolateral to 4-III, distal to 4-IV, and basomesad to 4-V. Intersegmental sclerites associated with abdominal terga II-VI tan to dark tan. *Paddle*: Pale tan, midrib not perceptibly darker; lateral margin spiculate from near base to apex, mesal margin similar but with few spicules basally. *Male genital lobe*: Tan, large (length [*l*] 0.54–0.57 mm, mean 0.56 mm, *n* 8; width [*w*] 0.40–0.46 mm, mean 0.43, *n* 8; mean *l:w* 1.30, range 1.23–1.37) but rather narrow; its width being similar to combined width of paddles.

TABLE 1. Number of branches for pupal setae of *Wyeomyia (Hystatomyia) chocoensis.*

	Cephalothorax	Abdominal segments							
Seta no.	CT	I	II	III	IV	V	VI	VII	VIII
0	–	–	1	1	1	1	1	1	1
1	2	13–22(14)	5–12(8)	5–11(8)	5–13(5,7)	4–8(6)	4–10(6)	2–4(2)	–
2	3–7(5)[1]	1,2(1)	1,2(1)[2]	1	1	1	1	1	–
3	3,4(3)	1,2(1)	1	1	2,3(2)	3–5(3)	1–4(2)	1	–
4	4–6(4)	4–7(6)	4–8(7)	2,3(2)	1–3(2)	3–7(4)	1–4(2)	1,2(2)	1,2(1)
5	1	2,3(2)	2–4(3)	3–6(4)	1	1	1	1,2(1)	–
6	3–6(4)	1,2(1)	1	2,3	2–4(2,3)	2–4(3)	1,2(1)	1,2(1)[2]	–
7	2–5(4)	2–6(4)	2–5(4)	2–6(3)	2–4(3)	3–6(5)	1–3(2)	1	–
8	2,3(2)	–	–	3–6(4)	2–4(3)	2–4(3)	3–6(4)	2–6(3)	–
9	2–4(3)	1,2(1)[2]	1	1	1	1	1	11–13(12)	18–21(21)
10	2–4(3)	–	–[3]	2–4(3)	2–4(3)	2,3	2–4(2)	2,3	–
11	1,2(1)	1,2(2)	1,2(1)[4]	1–3(1)	2,3(2)[2]	2	3,4(3)	1–3(2)	–
12	2–4(3)	–	–	–	–	–	–	–	–
13	–	–	–	–	–	–	–	–	–
14	–	–	–	–	–	–	–	–	1

[1] *Range followed in parenthesis by mode; based on 8 specimens (16 setae).*

[2] *One exception from number in parenthesis.*

[3] *Usually absent, 2-branched when present.*

[4] *Often only puncture present.*

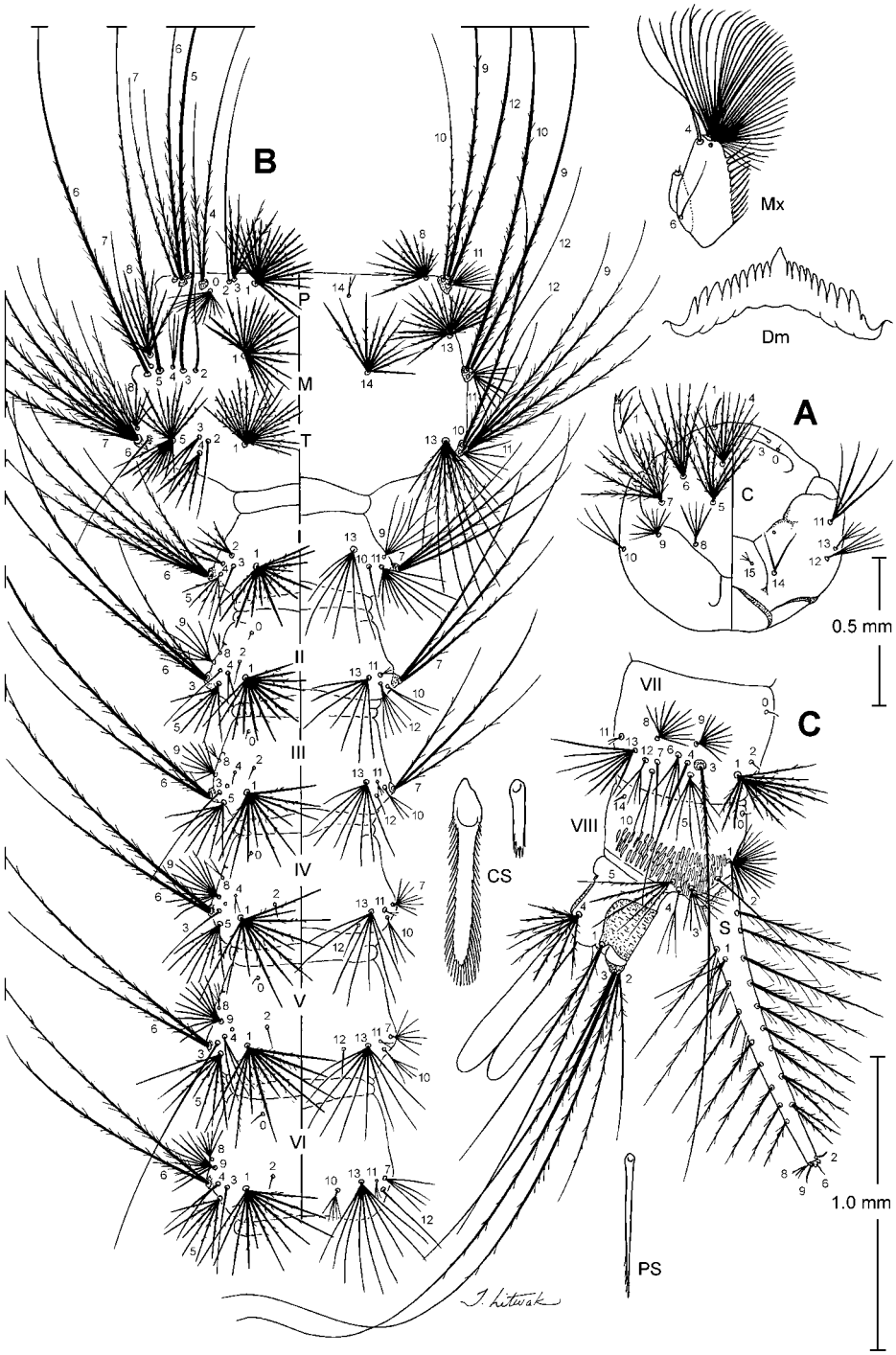

FIGURE 2. Fourth-instar larva of *Wyeomyia chocoensis*. A, Head, dorsal and ventral aspects of left side; B, thorax and abdominal segments I-VI, dorsal and ventral aspects of left side; C, abdominal segments VII-X, left side. Abbreviations: C, cranium; CS, comb scale; Dm, dorsomentum; M, mesothorax; Mx, maxilla (ventral aspect); P, prothorax; PS, pecten spine; S, siphon; T, metathorax; I–X, abdominal segments; 1–15, setal numbers for specified areas.

TABLE 2. Number of branches for larval setae of *Wyeomyia (Hystatomyia) chocoensis*.

	Head	Thorax			Abdominal segments								
Seta no.	C	P	M	T	I	II	III	IV	V	VI	VII	VIII	X
0	1	10–17 (13)	_	_	_	1	1	1	1	1	1	1	_
1	1	14–27 (19)	18–31 (24)	14–23 (21)	12–21 (13)	10–21 (13)	10–19 (11)	9–18 (11)	9–17 (11)	9–17 (11)	10–18 (14)	16–25 (20)	2
2	_	1	1	1,2 (1)	2–5 (3)	1,2 (1)	1	1	1	1	1	1	2,3 (3)
3	1	4–7 (5)	1	3,4 (3)	1,2 (1)[2]	1	1	1	1	1	1	7–12 (8)	2,3 (2)
4	6–13 (9)[1]	2	2,3 (3)	3–6 (4)	1–3 (2)	2–5 (2)	1–3 (1)	1–3 (2)	2–4 (3)	2	1	2,3 (3)	7–11 (8)
5	5–9 (7)	1	1	17–28 (19)	4–7 (5)	5–9 (6)	6–10 (7)	6–12 (7)	7–10 (7)	6–10 (6,7)	6–8 (6)	5–7 (5,6)	_
6	5–8 (6)	2,3 (2)[2]	1	1	5,6 (5)	3,4 (3)[2]	2	2	2	2	3–6 (4)	_	_
7	7–11 (8)	1	1,2 (1)	9–12 (9)	3–5 (4)	3,4 (3)[2]	3,4 (3)[2]	6–10 (8)	6–11 (6,8)	4–8 (6,7)	1	_	_
8	4–6 (5)	12–20 (14)	6–11 (7)	7–12 (8)	_	2,3 (2)	3–5 (3)	1–3 (2)	2–4 (3)	5–9 (6)	8–15 (11)	_	_
9	7–12 (9)	1	1	5–7 (5)	4–8 (6)	6–16 (7)	6–16 (8)	8–19 (11)	8–16 (11)	9–18 (9,10)	9–14 (12)	_	_
10	2–5 (3)	1	1	1	1,2 (1)[2]	1,2 (2)[2]	2,3 (3)	2–4 (3)	3–5 (4)	4–7 (5)	2	_	_
11	3–5 (4)	7–11 (9)	6–12 (7,8)	4–8 (5,6)	8–13 (10)	2–5 (2)	1–4 (3)	1–3 (2,3)	1–4 (2)	1–4 (3)	2–6 (2,3)	_	_
12	3–6 (4)	1	1	1	_	3–6 (3)	1–3 (1)	1,2 (1)	1,2 (1)	1,2(1)	3–5 (4)	_	_
13	3–5 (4)	_	16–23 (20)	9–13 (10)	6–10 (7,8)	6–11 (7)	7–10 (8)	7–11 (8)	7–12 (9)	7–12 (8,10)	8–11 (8)	_	_
14	2,3 (2)[2]	1,2 (2)	8–14 (11)	_	_	_	_	_	_	_	_	1	_
15	2–4 (3,4)	_	_	_	_	_	_	_	_	_	_	_	_

[1] Range followed in parenthesis by mode; based on 8 specimens (16 setae).

[2] One exception from number in parenthesis.

FOURTH-INSTAR LARVA (Fig. 2). Position and character of setae as figured; numbers of branches presented in Table 2. *Head*: Slightly wider than long and light tan. Collar absent. Slits of occipital foramen extending laterally to near base of pigmented area representing compound eye but not reaching lateral margin of head capsule. Margins of occipital foramen surrounding each slit darkly tanned, especially at thickened lateral end. Hypostomal suture complete, slightly curved, ending caudally at posterior tentorial pits (PTP). Posterior tentorial pits located about midway between seta 14-C and caudal margin of head capsule. Dorsomentum with 1 large central tooth and usually 9 (8–10) pairs of smaller lateral teeth. *Maxilla (Mx)*: Mesal margin produced and rounded; maxillary brush quite long, maxillary brush spicules similar in length to seta 4-Mx (0.19 mm); 4-Mx stout and forked or branched near tip. Seta 1-Mx very short, stout (~0.012 mm); seta 2-Mx about 0.035 mm in length, basal to 1-Mx; seta 3-Mx absent but tiny papilla present; seta 6-Mx prominent, single, about 0.06 mm in length. *Mandible*: Short, dorsal mandibular tooth with tip somewhat blunt, about twice as long as 3 teeth below it. Mandibular rake blade prominent, arising at base of mandibular teeth on ventral surface. Mandibular rake comprised of 8 or 9 stout spicules, each about 0.08 mm in length. Mandibular lobe with distinct basal protrusion from which cluster of spicules arise (Mandibular lobe spicules 1 [MLS_1]). Seta 2-Mn single, about 0.33 longer than adjacent spicules of mandibular brush (MnB). Mandibular sweeper 1 (MnS_1) comprised of about 6 long, slender spicules (~ 0.12 mm in length); mandibular sweeper 2 (MnS_2) with 6–8 spicules similar in length to those of MnS_1. *Antenna*: Short (0.25–0.29 mm, mean 0.27 mm, *n* 10), slender; seta 1-A 2-branched (occasionally 3-branched or single) borne dorsally about 0.69 (mean of 10) from base and extends to or slightly beyond tip of antenna. *Cranium setae:* 1-C strongly developed, stout; 4–7-C multi-branched, 7-C weakly and 4–6-C weakly to moderately aciculate, 4-C slightly shorter than 5–7-C; 8,9-C multi-branched, very slender, similar in length; 12,13-C multi-branched, 13-C shorter and more slender than 12-C. *Thorax*: Seta 0 of prothorax (0-P) stellate, mesad of 4-P; 1-P stellate, weakly aciculate; 2-P quite long, weakly aciculate near base, slightly dorsal to 3-P; 5–7-P clustered together, 7-P slightly ventral to 5,6-P and about 0.4 length of 5-P; 9–12-P clustered together, 9-P very long, slightly more than twice length of 10-P, 12-P slightly longer than 10-P; 14-P forked or 2-branched, occasionally single. Seta 1 of mesothorax (1-M) prominent, stellate, branches weakly to moderately aciculate; 2,3-M single, 2-M often more than 0.5 length of 3-M, base of 2-M as wide or wider than base of 3-M; 5-M dorsomesad to 6,7-M, 7-M about 0.33 length of 5-M, 6-M slightly longer than 5-M; 9–12-M clustered together, 9-M slightly longer than 10-M, 12-M less than 0.5 length of 10-M; 13-M prominent, stellate, located on ventrolateral margin anterior to 9–12-M setal cluster; 14-M prominent, stellate with longest branches about 0.25–0.29 mm in length. Seta 1 of metathorax (1-T) prominent, stellate, branches weakly aciculate; 4-T strong, distal to 2,3-T; 5-T prominent, stellate, located about halfway between 2-T and 6-T; 6-T single, relatively small, similar in length to 12-T; 7-T with aciculate branches; 13-T prominent, branches weakly aciculate, longest branches about 0.52–

0.55 mm in length. *Abdomen*: Seta 1-I–VII well developed, stellate, weakly to moderately aciculate. Seta 2-I laterad of 1-I, strong, often 3-branched, basal to 3,4-I; 2-II single or 2-branched, basal to 1-II; 2-III small, basal and slightly mesad of 1-III; 2-IV–VII small, distinctly mesad of 1-IV–VII. Seta 3-I mesad of 4-I, slender, about twice the length of 4-I; 3-II laterad of 4-II; 3-IV,V slightly dorsal to 6-IV,V; 3-V long, about 0.8–1.0 length of shorter branch of 6-V; 3-VI mesad of 4-VI, similar in length to 3-I–IV; 3-VII very long, aciculate. Seta 4-I laterad of 3-I, usually 2-branched; 4-II slightly mesad of 3-II; 4-III,IV well basolaterad of 1-III,IV, very small, less than 0.5 length of 9-III,IV; 4-V laterad of 1-V, longer than 9-V; 4-VI slightly dorsad to 6-VI. Seta 6-I with 5 or 6 branches; 6-II–VI strongly developed, long; 6-II 3-branched, longest branch about 1.5 times or more length of longest 6-I branch; 6-III–VI 2-branched; 6-VII relatively short, usually 4-branched. Seta 7-I usually 4-branched, similar in length to 6-I; 7-II 3-branched, shorter than longest branches of 6-II; 7-III 3-branched, usually less than 0.5 length of 6-III; 7-IV–VI multi-branched, weaker than 9-IV–VI, 7-IV distinctly shorter than 9-IV but 7-VI similar in length to 9-VI. Seta 10-I single, mesad of 11-I ventrally; 10-II 2-branched, slightly disto-laterad of 12-II; 10-III usually 3-branched, located between 6-III and 12-III; 10-IV with 2 or 3 branches, 10-V 3–5-branched; 10-VI frequently 5-branched, well mesad of 13-VI on ventral surface. Seta 11-I prominent, stellate, often slightly smaller than 13-I; 11-II–VI tiny, often with 2 or 3 branches. Seta 13-I–VII well developed, mesad of ventral setae with the exception of 12-IV,V, 10-VI, and 11-VII. *Segment VIII*: Comb plate absent; comb scales in about 4 irregular rows, proximal to distal gradation in scale size with smallest scales in proximal row (mean number of scales 65, range 53–72, *n* 8); individual scales relatively narrow with apical end somewhat flared and fringed. Seta 1-VIII stellate, slightly dorsad of dorsal most comb scale; all setae of segment VIII dorsal to origin of segment X; seta 2-VIII single, rather long, about 0.6 length of siphon; 4-VIII slender, usually 3-branched. *Siphon*: Long, slender (mean length 0.95 mm, range 0.86–1.04 mm, *n* 12), straight or very slightly curved distally, pigmentation uniformly light except darker along basal edge, surface smooth, siphon index 6.6–8.3 (mean 7.3, *n* 12). Pecten comprised of 4–8 (mode 7, *n* 12) slender spine-like spicules, somewhat fringed apically; basal spicule often slightly distal to seta 1-S. Seta 1-S with 3 or 4 branches, located basally about 0.14 (mean of 11) of siphon's length. Ventral accessory setae (1a-S) usually unbranched although penultimate seta sometimes 2-branched and distal seta infrequently 2-branched or forked; setae arranged in 2 rows, one on either side of siphon along ventral margin, approximated distally, corresponding setae of each row often paired; number of setae in 2 rows combined varied from 12–17 (mean 14, *n* 13); distal-most seta variable in length but often extends to or slightly beyond tip of siphon. Majority of dorsal accessory setae (2a-S) unbranched, although 2 distal-most setae 2-branched (infrequently single or 3-branched); in addition, setae 3 and 4 from distal end usually 2-branched and fifth seta from distal end occasionally 2-branched; distal seta does not reach tip of siphon; basal-most 2a-S seta tends to be shorter than adjacent setae, e.g., about 0.85 (range 0.72–0.95, *n* 12) length of

third and fourth setae from base; setae arranged in 2 rows, one on either side of siphon along dorsal margin, approximated distally, corresponding setae of each row often paired; number of setae in 2 rows combined varied from 17–26 (mean 21, *n* 12). Seta 2-S strong, laterally compressed, slightly sinuate with hook-like apex; seta 6-S, 8-S, and 9-S single. *Segment X*: Saddle tan, darker than siphon; extends near to ventral surface, mean length measured dorsally 0.20 mm (*n* 10); surface of saddle smooth but minutely spinulate, saddle marginal spicules absent. Seta 1–3-X well developed; seta 1,3-X 2-branched, long; seta 2-X 3-branched (rarely 2-branched), smallest (upper) branch about 0.67 length of middle branch and usually about 0.25–0.33 length of lower branch; seta 4-X 7–11-branched (mode 8, *n* 24), without basal support plate.

ETYMOLOGY. The name *chocoensis* is derived from Chocó, the name of an Indian tribe in northwestern Colombia and the political division, Department of Chocó. Chocó also has been used in a biogeographic sense to define this region of exceptional endemicity and species richness; e.g., the Chocó refuge of Haffer (1974) and the Chocó phytogeographic region of Gentry (1982).

BIONOMICS. Larvae of *Wy. chocoensis* were found in tank bromeliads growing in a variety of coastal habitats in the geographic area of Ensenada de Utria and southward to Jurubida. This region is located along the northern Pacific Coast of the Department of Chocó, Colombia. Larvae of *Wy. chocoensis* were rather ubiquitous, occurring in bromeliads within mangrove, at the edge of mangrove and in adjacent forest. In most instances, only a few larvae were found in a given bromeliad, and they tended to be associated with smaller bromeliad plants, i.e., those holding between 100–600 ml of water. Bromeliads containing larvae of *Wy. chocoensis* varied in their height above ground level from 0.6 m to 12.5 m, the latter representing the highest plants sampled. No preferences were apparent with regard to the species of tank bromeliad used as a larval development site. Thus, larvae of *Wy. chocoensis* were found in all of the common tank bromeliads indigenous to the region (*Guzmania scherzeriana* Mez, *G. musaica* [Linden & André] Mez, *G. glomerata* Mez & Wercklé, *G. lingulata* [L.] Mez, *Werauhia ringens* [Griseb.] J.R. Grant, *W. gladioliflora* [H. Wendland] J.R. Grant, *W. sanguinolenta* [Linden ex Cogniaux & Marchal] J.R. Grant, *Aechmea dactylina* Baker, and *A. pubescens* Baker).

DISTRIBUTION. *Wyeomyia chocoensis* is known only from the coastal localities of the Department of Chocó, Colombia (Ensenada de Utria and southward to Jurubida), where the type specimens were collected.

MATERIAL EXAMINED.

Sixty-nine specimens (31♂, 5♀, 6♂G, 3♀G, 4Le, 10 Pe, 10L), including 4 complete and 6 partial individual rearings. *Holotype*, ♂ (CO111-103), with dissected genitalia on microscope slide, COLOMBIA: Chocó, Ensenada de Utria (6°01.3'N 77°21.0'W), 15-II-1999, 0–10 m, hbt: *Guzmania scherzeriana* Mez, (*Wolff & Porter*) (USNM). *Paratypes*, COLOMBIA: Chocó, Ensenada de Utria (6°01.3'N 77°21.0'W), 15-II-1999 (1♂ 1♀ 1LePe♀ 1L – CO111-3, -15, -20), 0–10 m, hbt: *Guzmania scherzeriana* Mez, (*Wolff &*

Porter); same locality, 15-II-1999 (2♂ 1Pe♂ 1L – CO116-17, -40, -42), 0–10 m, hbt: *Guzmania scherzeriana* Mez, (*Wolff & Porter*); same locality, 20-II-1999 (2♂ 1♂G 1Pe♂ 2L – CO1175-1, -101 with dissected genitalia, -112), 0–10 m, hbt: *Werauhia gladioliflora* (H. Wendland) J.R. Grant, (*Wolff & Porter*); same locality, 20-II-1999 (1♂ 1♂G 1LePe♂ – CO1176-110 with dissected genitalia), 0–10 m, hbt: *Aechmea dactylina* Baker, (*Wolff & Porter*); same locality, 25-VI-1999 (2♂ 1♂G – CO11136-100, -101 adult on microscope slide with dissected genitalia), 0–10 m, hbt: *Werauhia sanguinolenta* (Linden ex Cogniaux & Marchal) J.R. Grant, (*Wolff & Porter*); Chocó, Ensenada de Utria (6°03.1'N 77°21.5'W), 17-II-1999 (5♂ 1♂G 1♀ 1♀G 1LePe♂ 1L – CO1141-11 adult on microscope slide with dissected genitalia, -12, -101 adult on microscope slide with dissected genitalia, -106, -108, -110, -111), 0–10 m, hbt: *Guzmania scherzeriana* Mez, (*Wolff & Porter*); same locality, 18-II-1999 (1♂ 1L – CO1145-13, -104), 0–10 m, hbt: *Guzmania scherzeriana* Mez, (*Wolff & Porter*); same locality, 18-II-1999 (2♂ 1Pe♂ – CO1148-14, -101), 0–10 m, hbt: *Werauhia ringens* (Griseb.) J.R. Grant, (*Wolff & Porter*); same locality, 18-II-1999 (1♂ – CO1149-5), 0–10 m, hbt: *Werauhia ringens* (Griseb.) J.R. Grant, (*Wolff & Porter*); same locality, 27-VI-1999 (1♂ 1♂G – CO11172-29 adult on microscope slide with dissected genitalia), 0–10 m, hbt: *Werauhia ringens* (Griseb.) J.R. Grant, (*Wolff & Porter*); Chocó, Ensenada de Utria (6°03.0'N 77°20.2'W), 24-VI-1999 (1♂ 1♂G – CO11101-103 with dissected genitalia), 50 m, hbt: *Guzmania scherzeriana* Mez, (*Wolff & Porter*); Chocó, Ensenada de Utria (6°03.1'N 77°21.0'W), 24-VI-1999 (2♂ 1LePe♂ – CO11107-5, -13), 50 m, hbt: *Guzmania musaica* (Linden & André) Mez, (*Wolff & Porter*); same locality, 26-VI-1999 (2L – CO11142-11, -12), 50 m, hbt: *Guzmania musaica* (Linden & André) Mez, (*Wolff & Porter*); same locality, 26-VI-1999 (2♂ 1♀ – CO11148-9, -100, -102), 50 m, hbt: *Guzmania glomerata* Mez & Wercklé, (*Wolff & Porter*); same locality, 26-VI-1999 (1L – CO11153-3), 50 m, hbt: *Guzmania musaica* (Linden & André) Mez, (*Wolff & Porter*); same locality, 26-VI-1999 (1L – CO11154-3), 50 m, hbt: *Guzmania musaica* (Linden & André) Mez, (*Wolff & Porter*); Chocó, Ensenada de Utria (6°03.1'N 77°22.0'W), 28-VI-1999 (1♂ 1♀ – CO11178-100, -101), 10 m, hbt: *Aechmea pubescens* Baker, (*Wolff & Porter*); Chocó, Ensenada de Utria (6°02.8'N 77°22.6'W) 28-VI-1999 (3♂ 1♀ 1♀G – CO11181-12, -101 with dissected genitalia, -106, -110), 20 m, hbt: *Guzmania lingulata* (L.) Mez, (*Wolff & Porter*); Chocó, Nuquí, Río Chori (5°50'N 77°17'W), 19-II-1999 (1♀ 1♀G – CO1171-101 with dissected genitalia), 0–10 m, hbt: *Werauhia sanguinolenta* (Linden ex Cogniaux & Marchal) J.R. Grant, (*Wolff & Porter*); same locality, 19-II-1999 (1♂ 1Pe♂ – CO1172-100), 0–10 m, hbt: *Werauhia gladioliflora* (H. Wendland) J.R. Grant, (*Wolff & Porter*); Chocó, Nuqui, Morro Mico (5°52'N 77°18'W), 21-IX-1999 (1♂ 1Pe♂ – CO11189-100), 10 m, hbt: *Guzmania scherzeriana* Mez, (*Wolff & Porter*); same locality 22-IX-1999 (1♂ 1Pe♂ – CO11239-101), 10 m, hbt: *Guzmania scherzeriana* Mez, (*Wolff & Porter*).

***Wyeomyia (Hystatomyia) intonca* Dyar & Knab**
(Figs. 3–6)

Wyeomyia intonca Dyar & Knab, 1910: 173. Holotype ♂, Empire, Canal Zone, Panama (USNM); examined. Synonymy with *Wyeomyia (Dendromyia) circumcincta* Dyar & Knab by Lane, 1945: 146. Resurrected from synonymy and placed in subgenus *Hystatomyia* by Judd, 1998: 579.

Hystatomyia intonca: Dyar, 1919: 141, Pl. V (Fig. ♂G).

Wyeomyia (Hystatomyia) intonca: Dyar, 1923: 170 (Panama: list); Dyar & Shannon, 1924: 91 (Panama; list); Bonne & Bonne-Wepster, 1925: 59,76 (Canal Zone; A key).

Prosopolepis (Hystatomyia) intonca: Dyar & Shannon, 1924: 482 (list); Dyar, 1925: 120, 124 (Panama; collection records; L bionomics; ♂G key).

Dendromyia intonca: Dyar, 1926: 43, 44 (L description, bionomics); del Ponte, 1939: 540 (A).

Dendromyia (Hystatomyia) intonca: Dyar, 1928: 84, Pl. XVIII (Fig. ♂G, L; ♀, ♂, L; L bionomics).

Wyeomyia (Dendromyia) intonca: Edwards, 1932: 88 (Panama; list); Lane & Cerqueira, 1942: 606 (tentative synonym of *circumcincta* Dyar & Knab); Lane, 1945: 146 (synonym of *circumcincta* Dyar & Knab); Lane, 1953: 975 (synonym of *circumcincta* Dyar & Knab). Knight & Stone, 1977: 328 (synonym of *circumcincta* Dyar & Knab; info. on type).

Wyeomyia (Hystatomyia) sp. D = ?*intonca:* Heinemann & Belkin, 1978: 124, 160, 166. 194 (Panama; collection records; L bionomics).

Life stages as described for *Wy. chocoensis* with following exceptions:

MALE. *Head*: Frons with prominent puncture slightly below postfrontal suture. Ventral surface of proboscis with bright white scales from base to about 0.6 length where white scaling expands slightly (preapical patch) to ventrolateral margin; white scaling ends at about 0.75, replaced by dark scales to distal end. In many specimens, white scales are absent or very reduced slightly basad of preapical patch of white scales. Proboscis (P) (1.37–1.58 mm, mean 1.50 mm, *n* 5) longer than antennae (flagellum [F] 1.13–1.35 mm, mean 1.27, *n* 5), mean P:F, 1.18 (*n* 5), but shorter than forefemur, mean P:Fe-I 0.79 (*n* 5). Pedicel with 4–8 small setae dorsomesad. Flagellomere 1 with a primarily dorsomesad cluster of 5–10 scales; among 5 specimens (10 antennae) flagellomere 5 (Flm_5) quite uniform in length (0.08 mm), flagellomeres 12 and 13 more variable (Flm_{12} 0.10–0.14 mm, mean, 0.12; Flm_{13} 0.16–0.20 mm, mean 0.19); mean Flm_{13}:Flm_5 2.29. *Thorax*: Integument brown. Supraalar and antealar areas have combined sum of 22–33 (mean 27, *n* 5) dark brown setae. Mesopostnotum brown with medial cluster of 6–9 (mode 8) pale, occasionally dark, setae. Prealar area with 3–5 yellow setae. *Legs*: Forefemur slightly longer than foretibia (mean Fe-I:Ti-I 1.04, *n* 5); forefemur somewhat shorter than midfemur (mean Fe-I:Fe-II 0.89, *n* 5) but longer than hindfemur (mean Fe-I:Fe-III 1.25, *n* 5); forefemur longer than proboscis (mean Fe-I:P 1.26, *n* 5); ventral surface of forefemur with white scales over basal 0.2, white scaling tapers to rather narrow line at about 0.4 and continues as narrow line along posteroventral surface to apex; posteroventral surface of foretarsomere 1 ($Ta\text{-}I_1$) with white scales confined primarily to basal 0.5 and with darker scales with metallic reflection distally, in some specimens white scales extend as narrow line to distal end. Midfemur distinctly longer than midtibia (mean Fe-II:Ti-II 1.51, *n* 5); posteroventral sur-

face of midtibia and basal 0.3–0.6 of midtarsomere 1 (Ta-II_1) with bright white scales; midtarsomere 2 (Ta-II_2) primarily with bright white scales, extent of basal dark scaling quite variable but more extensive on posteroventral surface (0.4–0.6 length of Ta-II_2) than on anteroventral surface (0.2–0.3 length of Ta-II_2), dorsal surface often with white scales over entire length, but may be diminished or even replaced by dark scales over basal 0.2. Ungues of midtarsomere 5 dissimilar; larger unguis stout, dark, curved sharply to about 90° angle, tip blunt with apical spur. Hindfemur slightly longer than hindtibia (mean Fe-III:Ti-III 1.04, *n* 5), hindtarsomere 1 slightly longer than hindfemur (mean Ta-III_1:FeIII 1.08, *n* 5), ventral surface of Ta-III_1 often with narrow line of white scales to ~0.75 length or with scattered white scales to near distal end. Ungues of hindtarsomere 5 slender, unequal; longer unguis 0.08 mm, about 2x length of shorter, with moderate to slight curvature; shorter unguis often strongly curved near base. *Wing*: 1.97–2.25 mm (mean 2.13 mm, *n* 5). *Abdomen*: Lateral margins of abdomen with creamy white scales, which form an essentially straight line along abdomen; sterna covered with creamy white scales. Distal margin of sterna II–V with about 7–12 small pale setae, more numerous and longer pale setae along distal margin of sterna VI (~19) and VII (~24). *Genitalia* (Fig. 3C-G): Tergum VIII (ventral in position) narrow, 3.4–4.7x as wide as long; covered with small spicules, which become minute and very numerous basally although basal 0.3–0.5 glabrous; distal margin straight, 3 irregular rows of long dark setae (range 38–41, mean 40, *n* 6) along and near distal margin, longest setae about 2.1–2.5 times length of tergum VIII along median plane. Sternum VIII (dorsal in position) with distal margin somewhat convex; setae (range 23–27, mean 25, *n* 6) dark, arranged primarily as single row along distal margin; a few scales along lateral margins pale, rest dark. Tergum IX bearing 3, rarely 2, stout but relatively short setae on either side of narrow median bridge, apices of setae bent slightly laterad. Sternum IX narrow but expanded medially, becoming bell-shaped between base of gonocoxites; appears to be fused basally to gonocoxites; with rather broad U-shaped mesal membranous area; quite densely spiculate. Gonocoxite elongate, expanded basally; sternal basal surface spiculate with rather sparse covering of scales, an irregular row of setae just proximal to basal mesal setal clusters of tergum. Distal 0.5 of gonocoxite slender, distinctly bowed; mesal surface with slender setae distally that merge with dense subapical/apical cluster of dark setae (0.2–0.3 length of gonocoxite); setae on or near mesal margin curved distally toward median plane of genitalia. Tergal surface of gonocoxite with 4 prominent clusters of setae (3 occur close together in a basal mesal position): (1) basalmost cluster comprised of 10–13 (mean 11) unmodified, moderately developed pale setae; (2) adjacent to this cluster (slightly mesad and distal to it) is a group of 11–15 (mean 14) stout, rather long setae (~ 0.4 length of gonocoxite) with golden reflection, which terminate in curved spathe-like apex (a few smaller unmodified setae occur along edge of this cluster); (3) ventral (prerotation sense) and often slightly distal to these setae is a third group of 9 (rarely 10) somewhat longer (~ 0.5 length of gonocoxite), lanceolate-shaped setae with golden to copper reflection, these setae become slightly broader subapically

before bending sharply and narrowing to a fine tip; (4) fourth prominent cluster of setae laterad to three basal mesal clusters, usually consists of 28–41 (mean, 34) unmodified pale setae, longest often extending slightly beyond tip of gonocoxite. Gonostylus (Fig. 3D) arises basally on gonocoxite near mesal margin of lateral setal cluster; the glabrous and relatively transparent gonostylus extends mesally, then curves distally and becomes broader; expanded apical area about 3x width of basal portion (stem). Aedeagus slightly longer than wide; submedian tergal arms bend toward each other resembling an upside-down V, in some individuals the arms appear to be joined medially but in others they appear to remain slightly separated. Proctiger (in lateral view) with broad basal sclerotization of tergum X, paraproct with rounded apex and bearing 4–7 cercal setae.

FEMALE. Like male except for sexual characters as follows. *Head*: Ventral surface of proboscis often entirely dark scaled with exception of small cluster of white scales (preapical patch) from 0.6–0.7 length of proboscis; less frequently a narrow line of white scales extends from base of proboscis to preapical patch. *Thorax*: Integument light brown to brown. *Legs*: Resembling male but with several differences. Dorsal surface of midtarsomere 1 (Ta-II_1) with dark scales, white scales limited to basal 0.3 of posteroventral surface, most numerous on basal 0.1; midtarsomeres 2–5 (Ta-$II_{2–5}$) (Fig. 6A) with dark scales with metallic reflection, a few pale and white scales may be present near basal and/or distal end of Ta-$II_{2–4}$; Ta-II_5 with variable amount of pale scaling. *Genitalia* (Fig. 5A-D): Tergum VIII wider than long (width 0.43–0.48 mm, length along median plane 0.17–0.19 mm, *n* 2); covered with minute spicules and spatulate scales; distal margin slightly concave; setae confined to distal 0.5, most numerous along and near distal margin, absent from lateral margins, in total about 46–54 setae. Distal margin of sternum VIII with numerous strong, straight to slightly curved setae, which expand basally to form a mesal V-shaped cluster; in total about 55–69 setae. Insula wider than long, covered with moderately long spicules; apex broadly rounded to rather truncate, irregular anterolateral row of 5 or 6 small setae on either side of midline; mesal semicircular depression or cavity opening onto basal margin, prominent spicules along lower edges of opening. Dorsal postgenital lobe length 0.11 mm, dorsal postgenital lobe index 1.83–1.87 (see Reinert, 1974). Cercus rather flat; covered with minute spicules; apex rather truncate; dorsal surface with 12–16 setae, longest 0.6–0.7 length of dorsal postgenital lobe.

PUPA (Fig. 3A,B). Position and character of setae as figured; numbers of branches presented in Table 3. *Cephalothorax*: Tan with very pale to clear patches, especially along dorsal margin of scutal protrusion at base of trumpet. Seta 4-CT usually with 3 or 4 branches. Metathoracic wing tan with pale markings comprised of submedial pale spot and a slightly pale spot on each lateral margin. *Trumpet*: Length 0.84–1.26 mm (mean 1.08 mm, *n* 8); tan, darkest basally, distal end not quite as dark and slightly flared, medial portion similar in color to distal end or slightly paler. *Abdomen*: Abdominal tergum I rather uniformly tan although seta 6,7-I and occasionally 4,5-I within a pale spot. Seta 1-I well developed, most often with 18 or 19 branches. Seta 3-I moderately developed, usually

double; seta 3-IV–VI about one-third the length of 3-III, 3-IV with 3 or 4 branches, 3-V usually 4-branched, 3-VI 2–4-branched. Seta 5-I single, infrequently double; seta 5-II,III relatively small (approx. 0.2 mm), usually 4-branched; 5-IV–VI single, very long (approx. 1.1–1.2 mm). Puncture near seta 4-III–V, usually located distolaterad of seta 4-III,IV and basal mesal to seta 4-V. *Paddle*: Pale tan, somewhat darker along midrib. *Male genital lobe*: Large (length [*l*] 0.57–0.62 mm, mean 0.60 mm, *n* 8; width [*w*] 0.50–0.54 mm, mean 0.52 mm, *n* 8; mean *l:w* 1.14, range 1.11–1.16) with elliptical-shaped apex; distinctly broader than combined width of paddles.

TABLE 3. Number of branches for pupal setae of *Wyeomyia (Hystatomyia) intonca*.

	Cephalothorax	Abdominal segments							
Seta no.	CT	I	II	III	IV	V	VI	VII	VIII
0	–	–	1	1	1	1	1	1	1
1	2	14–21(18)	7–11(9,11)	6–10(8)	5–7(5)	4–7(5)	3–6(4)	2–4(2)	–
2	4–6(4,6)[1]	1,2(1)	1	1	1	1	1	1	–
3	3,4(4)	1,2(2)	1	1	2–5(3)	3–5(4)	2–4(3)	1	–
4	3–5(4)	6–9(6)	6–10(7)	1,2(2)	1–3(2)	3–7(4)	1,2(2)	2,3(2)[2]	1,2(2)
5	1,2(1)[2]	1,2(1)	3,4(4)	3,4(4)	1,2(1)[2]	1	1	1–3(2)	–
6	3–5(3,4)	1	1	1–3(2)	2,3	2,3(2)	1,2(1)	1	–
7	3–6(4)	3–6(4,5)	3–5(4)	2–4(3)	2–4(2)	4–6(5)	2–4(2)	1	–
8	2,3(3)	–	–	4–7(5)	2,3(3)	2–4(2)	4–6(5)	2–5(3)	–
9	2–4(4)	puncture[3]	1	1	1	1	1	11–13(12)	18–21(21)
10	3–5(3)	–	–	3,4(4)	2–4(3)	2–4(3)	2,3(3)	1–3(3)	–
11	1,2(1)	1,2(2)	1,2(1)	1,2	1,2(2)	1,2(2)	2–4(3)	1–3(2)	–
12	3,4(3)	–	–	–	–	–	–	–	–
13	–	–	–	–	–	–	–	–	–
14	–	–	–	–	–	–	–	–	1

[1] Range followed in parenthesis by mode; based on 8 specimens (16 setae).

[2] One exception from number in parenthesis.

[3] Very small, occasionally with seta with 1 or 2 branches.

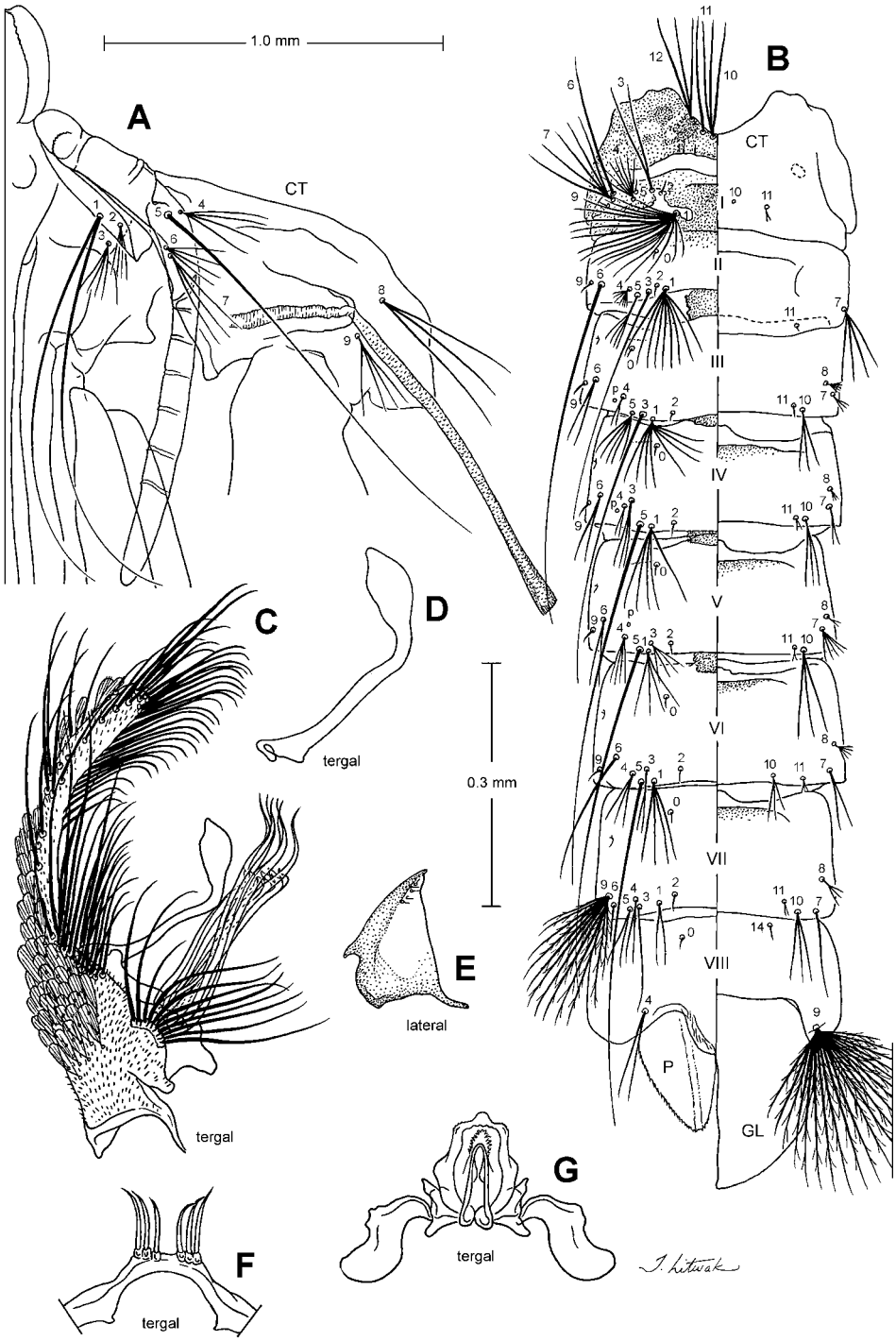

FIGURE 3. Pupa and male genitalia of *Wyeomyia intonca*. A, B, Pupa: (A) left side of cephalothorax, dorsal to right; (B) dorsal (left) and ventral (right) aspects of metathorax and abdomen, dorsal color pattern not illustrated for abdominal segments II–VIII. C–G, Male genitalia, aspects as indicated: (C) gonocoxite; (D) gonostylus; (E) proctiger (left side); (F) tergum 1X; (G) aedeagus, with parameres and basal pieces attached.

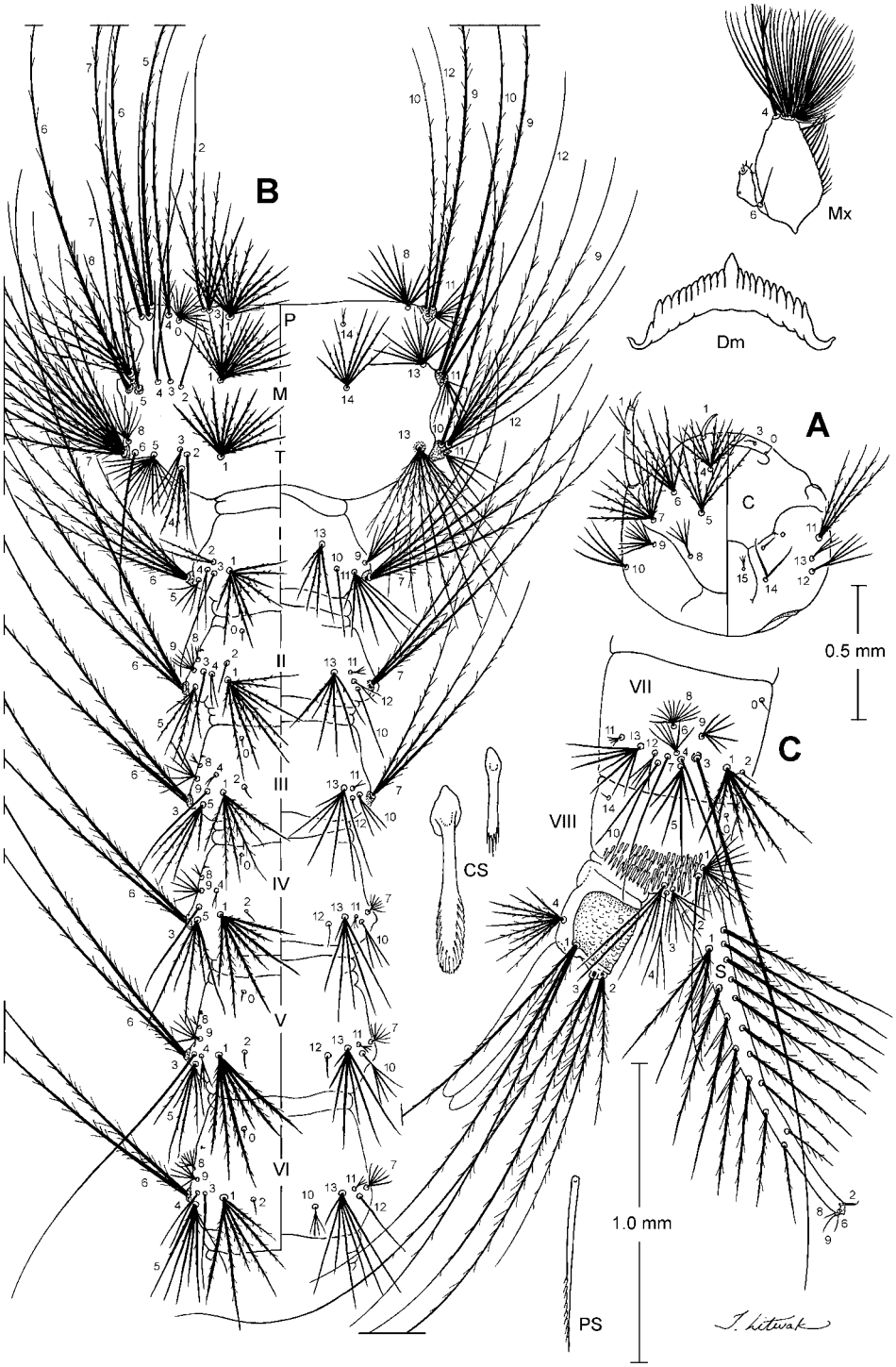

FIGURE 4 Fourth-instar larva of *Wyeomyia intonca*. A, Head, dorsal and ventral aspects of left side; B, thorax and abdominal segments I–VI, dorsal and ventral aspects of left side; C, abdominal segments VII–X, left side. For abbreviations see Fig. 2.

TABLE 4. Number of branches for larval setae of *Wyeomyia (Hystatomyia) intonca*.

	Head	Thorax			Abdominal segments								
Seta no.	C	P	M	T	I	II	III	IV	V	VI	VII	VIII	X
0	1	12–17 (14)	–	–	–	1	1	1	1	1	1	1	–
1	1	9–14 (12)	11–15 (15)	8–14 (11)	7–11 (9)	6–10 (7,8)	6–8 (6)	5–7 (7)	5–7 (7)	5–8 (6)	5–8 (6)	12–17 (14)	2
2	–	1	1	1,2(1)[2]	1–3(2)	1,2(1)	1	1	1	1	1	1	3
3	1	4–6 (5)	1	2–4 (3)	1	1	1	1	1	1	1	5–9 (7)	2
4	8–15 (12)[1]	2	2,3 (2)	3,4 (3)[2]	2,3 (2)	2,3 (2)	1–3 (2)	1–3 (2)	3,4 (3)[2]	2	1	2–4 (3)	7–10 (8,9)
5	4–8 (7)	1	1	12–17 (15)	3–6 (4)	4–6 (5)	4–6 (5)	4–6 (5)	5,6 (5)	5–7 (5,6)	4–6 (5)	5	–
6	4–8 (6)	2	1	1	5–7 (6)	3,4 (3)	2	2	2	2	4–6 (5)	–	–
7	7–13 (9)	1	1	10–13 (11)	3–5 (4)	3	3	6–9 (7)	6–9 (7)	5–9 (6,7)	1,2 (1)[2]	–	–
8	4,5 (4)	10–14 (11)	5–7 (6)	6–12 (7,9)	–	2,3 (2)	2–5 (4)	1,2 (2)	1–3 (2)	5–8 (7)	9–13 (11)	–	–
9	8–10 (9)	1	1	6–8 (6)	3–7 (5)	4–7 (6,7)	5–8 (6)	5–8 (5)	4–6 (5)	4–6 (5)	5–9 (6)	–	–
10	4–6 (4)	1	1	1	1	1–3 (2)	2,3 (3)	2–4 (3)	3–5 (4)	3–6 (4)	2,3 (2)	–	–
11	3,4 (4)	6–9 (7,8)	6–9 (6,7)	4–7 (5)	5–9 (7)	3,4 (3)	2,3 (3)	2–5 (3)	2–5 (3)	3–5 (3,5)	4–7 (4)	–	–
12	3–5 (4)	1	1	1	–	2–4 (2)	1	1	1	1,2 (1)	3–6 (4)	–	–
13	3,4 (3)	–	10–16 (14)	8–12 (10)	4–8 (5,6)	6–8 (6)	4–8 (6,7)	6–9 (6)	5–8 (7)	5–7 (7)	6–8 (7)	–	–
14	1,2 (2)[2]	1,2 (2)	6–9 (8)	–	–	–	–	–	–	–	–	1	–
15	2–4 (3)	–	–	–	–	–	–	–	–	–	–	–	–

[1] Range followed in parenthesis by mode; based on 8 specimens (16 setae).

[2] One exception from number in parenthesis.

FOURTH-INSTAR LARVA (Fig. 4). Position and character of setae as figured; numbers of branches presented in Table 4. *Head*: Dorsomentum with 1 large central tooth and 9–11 pairs of smaller lateral teeth. *Maxilla*: Maxillary brush quite long, maxillary brush spicules similar in length to seta 4-Mx (0.23 mm). Seta 1-Mx short, stout (0.015 mm); seta 2-Mx very slender, approx. 0.025 mm in length, basal to 1-Mx. *Mandible*: Mandibular

rake comprised of approximately 8 stout spicules, each about 0.12 mm in length. *Antenna*: Short (mean 0.29 mm, *n* 10), slender; seta 1-A 2-branched (rarely single), borne dorsally about 0.68 (mean of 10) length and usually not quite reaching tip of antenna. *Thorax*: Seta 14-P single, sometimes forked or 2-branched. Seta 2-M less than 0.5 length of 3-M, base of 2-M slightly narrower than base of 3-M; 7-M about 0.25–0.33 length of 5-M; 9,10-M long, similar in length. *Abdomen*: Seta 2-I laterad of 1-I, stout, often 2-branched; 2-II usually single, basal to 1-II; 2-III–VII distinctly mesad of 1-III–VII. Seta 3-I more than twice length of 2,4-I; 6-VII 4–6-branched, rather short;10-VI usually 4-branched. Seta 11-I prominent, stellate, branches similar in length to those of 13-I. *Segment VIII*: Comb scales in 4 or 5 irregular rows (mean number of scales 69, range 58–76, *n* 9). Seta 2-VIII single, rather long, about 0.5 length of siphon. *Siphon*: Long, slender (mean length 1.17 mm, range 1.04–1.28 mm, *n* 12) usually somewhat curved distally, wider at base, lightly pigmented with subapical region of darker pigmentation and basal edge quite dark, surface smooth; siphon index 7.8–8.9 (mean 8.2, *n* 11). Pecten comprised of 5–8 (mode 6, *n* 12) spine-like spicules, somewhat fringed apically; basal spicule close to seta 1-S, often slightly distal to it. Seta 1-S usually with 3 or 4 branches; located basally at about 0.13 (mean of 12) of siphon's length. Ventral accessory setae (1a-S) unbranched, arranged in 2 rows; number of setae in 2 rows combined 12–16 (mean 14, *n* 12); length of distal-most seta usually slightly shorter than distance of seta to distal end of siphon. Dorsal accessory setae (2a-S) unbranched, infrequently a distal seta is forked; arranged in 2 rows; number of setae in 2 rows combined 11–19 (mean 17, *n* 14); basal-most seta approximately same length as third and fourth setae from base; distal seta not extending to tip of siphon. *Segment X*: Saddle tan, similar in color to darkened subapical area of siphon; extending near to ventral surface, mean length of 0.22 mm (*n* 12) measured dorsally. Setae 1–3-X well developed; setae 1,3-X 2-branched, all long; 2-X 3-branched, smallest (upper) branch about 0.4–0.8 length of middle branch, which is quite variable, and about 0.25–0.33 length of lower branch; seta 4-X 7–10-branched (mode 8,9, *n* 23), about 0.30 mm in length.

BIONOMICS. *Wyeomyia intonca* originally was described from a male, which had been collected as a larva or pupa from a bromeliad on a fallen tree at the edge of Comacho river, Canal Zone, Panama (Dyar & Knab, 1909). In 1925 Dyar indicated larvae of *Wy. intonca* occur in *Tillandsia*, and in 1926 published a brief description of the larval stage from specimens found in "wild pineapple, *Ananas magdalenae* (André) Standl." These plants were found in "jungle, some three miles back of Fort Randolph on the Atlantic side of the Isthmus." Heinemann & Belkin (1977a,b, 1978) reported collections of *Wy.* ?*intonca* (3 different forms designated D, G and H) from 15 bromeliad samples (Panama, 5; Costa Rica, 9; and Nicaragua, 1), which were primarily from forested areas at elevations of 100 m and 500–700 m. However, only *Wy. (Hystatomyia)* sp. D appears to correspond with *Wy. intonca*, and it was encountered only in Panama. Our collections, upon which the redescription is largely based, were from the northern Pacific Coast of Colombia, specifically Ensenada de Utria and southward to Jurubida. In this region, *Wy. intonca* was closely associated with coastal mangroves, which tended to be quite variable with respect to dominant

tree species. Piñuelo mangrove dominated by *Pelliciera rhizophorae* Tr. & Pl. (Pelliciera-ceae) and with numerous tank bromeliads (dominants include: *Werauhia ringens* [Griseb.] J.R. Grant, *W. sanguinolenta* [Linden ex Cogniaux & Marchal] J.R. Grant, and *W. gladioliflora* [H. Wendland] J.R. Grant) appeared to be a particularly suitable habitat for *Wy. intonca*. This mosquito also was abundant in red mangrove dominated by *Rhizophora harrisonii* Leechm. and *R. mangle* L. (Rhizophoraceae); dominant tank bromeliads include *W. sanguinolenta*, *W. gladioliflora*, *W. kupperiana* (Suess.) J.R. Grant, and *Aechmea pubescens* Baker. Within these mangroves, larvae of *Wy. intonca* were found in tank bromeliads located from 0.6 to 2.5 m above ground and were found primarily in larger plants, i.e., those with 0.5 to 1+ liters of water. *Wyeomyia intonca* was not encountered in bromeliads from forested areas adjacent to these mangroves, even though sampling was quite extensive.

DISTRIBUTION. Collection records from Panama suggest the distribution of *Wy. intonca* extends from the Canal Zone to Colombia. At present, the known distribution of this mosquito in Colombia is limited to our collections from the northern Pacific Coast of the Department of Chocó (Ensenada de Utria and southward to Jurubida).

MATERIAL EXAMINED.

Sixty-seven specimens (22♂, 4♀, 10♂G, 3♀G, 4Le, 15Pe, 9L), including 4 complete and 11 partial individual rearings. *Holotype*, ♂, genitalia on microscope slide, PANAMA: DK, 5-09, Type No. 12744 U.S.N.M. (red tag). *Non-types*, PANAMA: Canal Zone, Gatun, Jan. 1928 (1♂ 1♂G 1LePe ♂ 11146-m with dissected genitalia), (*C.H. Bath Coll.*), (blue tag). COLOMBIA: Chocó, Ensenada de Utria (6°03.1'N 77°21.5'W), 18-II-1999 (3♂ 1♀ 1♀G 2LePe♂ 1Pe♂ 1L – CO1143-3, -4, -6, -101 with dissected genitalia, -102), 0–10 m, hbt: *Werauhia sanguinolenta* (Linden ex Cogniaux & Marchal) J.R. Grant, (*Wolff & Porter*); same locality, 18-II-1999 (1L – CO1144-19), 0–10 m, hbt: *Werauhia sanguinolenta* (Linden ex Cogniaux & Marchal) J.R. Grant, (*Wolff & Porter*); same locality, 18-II-1999 (1L – CO1145-8), 0–10 m, hbt: *Guzmania scherzeriana* Mez, (*Wolff & Porter*); same locality, 18-II-1999 (1♂ 1♂G 1Pe♂ 1L – CO1147-8, -103 adult on microscope slide with dissected genitalia), 0–10 m, hbt: *Guzmania scherzeriana* Mez, (*Wolff & Porter*); same locality, 18-II-1999 (1♂ 1Pe♂ 1L – CO1148-8, -104), 0–10 m, hbt: *Werauhia ringens* (Griseb.) J.R. Grant, (*Wolff & Porte*r); same locality, 18-II-1999 (3♂ 1♂G 1♀ 1LePe♂ 1Pe♂ – CO1149-25, -112, -114 with dissected genitalia, -121), 0–10 m, hbt: *Werauhia ringens* (Griseb.) J.R. Grant, (*Wolff & Porter*); same locality, 24-VI-1999 (2♂ 1Pe♂ – CO11106-5, -101), 0–10 m, hbt: *Werauhia sanguinolenta* (Linden ex Cogniaux & Marchal) J.R. Grant, (*Wolff & Porter*); same locality, 27-VI-1999 (1♂ 1Pe♂ 2L – CO11171-14, -118), 0–10 m, hbt: *Werauhia ringens* (Griseb.) J.R. Grant, (*Wolff & Porter*); same locality, 27-VI-1999 (1♂ 1♂G 2L – CO11172-4, -21 adult on microscope slide with dissected genitalia), 0–10 m, hbt: *Werauhia ringens* (Griseb.) J.R. Grant, (*Wolff & Porter*); Chocó, Ensenada de Utria (6°01.3'N 77°21.0'W), 20-II-1999 (1♂ – CO1175-4), 0–10, hbt: *Werauhia gladioliflora* (H. Wendland) J.R. Grant, (*Wolff & Porter*); Chocó, Nuquí, Jurubida, Río Chori (5°50'N 77°17'W), 19-II-1999 (7♂ 5♂G 2♀ 2♀G 4Pe♂ 1Pe♀ – CO1170-104 adult

on microscope slide with dissected genitalia, -119 adult on microscope slide with dissected genitalia, -103, -112 with dissected genitalia, -114 with dissected genitalia, -116 adult on microscope slide with dissected genitalia, -120 adult on microscope slide with dissected genitalia, -137, -144, -145, -148 with dissected genitalia), 0–10 m, hbt: *Werauhia sanguinolenta* (Linden ex Cogniaux & Marchal) J.R. Grant, (*Wolff & Porter*).

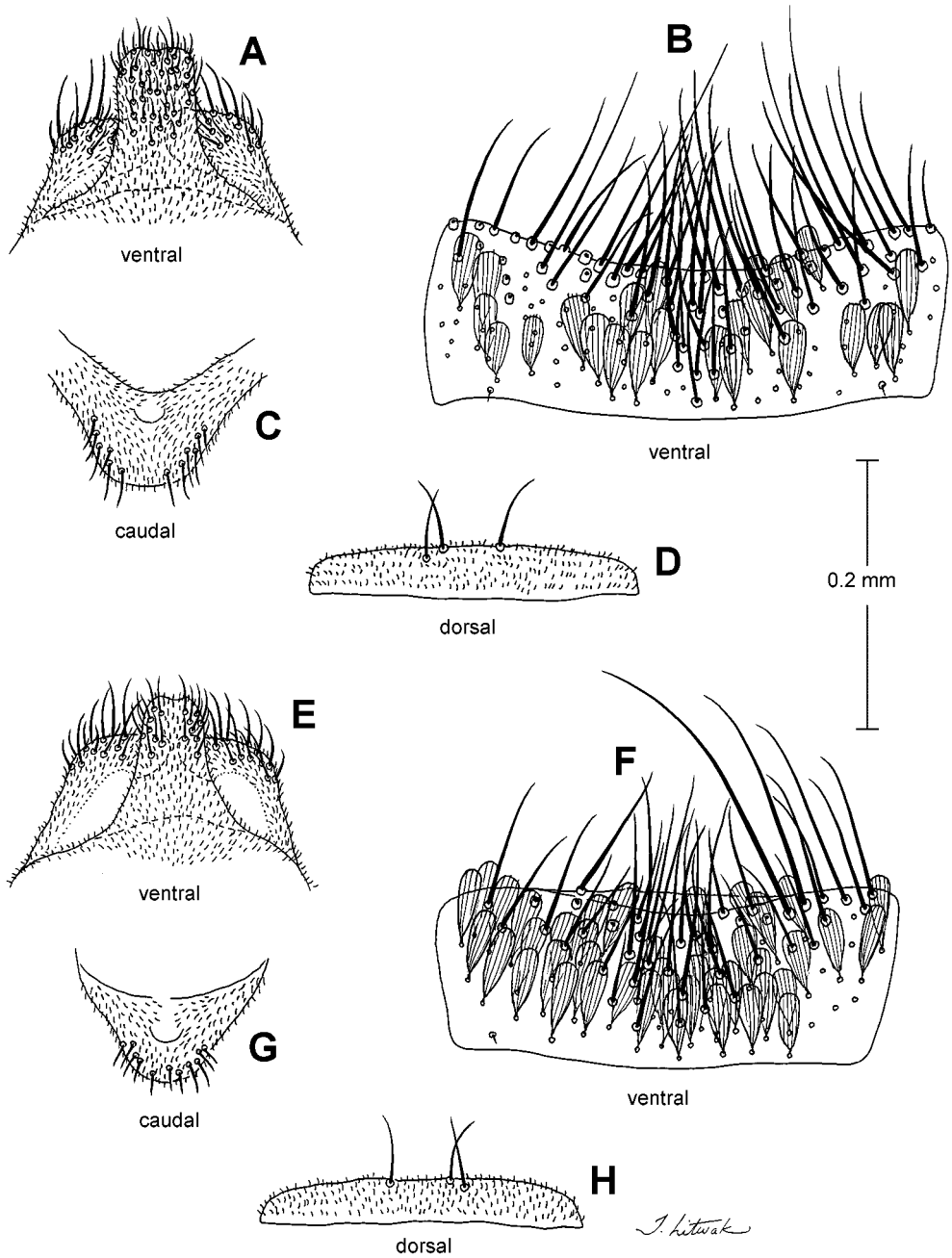

FIGURE 5. Female genitalia of *Wy. intonca* (A–D) and *Wy. chocoensis* (E–H), aspects as indicated: (A, E) postgenital lobe and cerci; (B, F) sternum VIII; (C, G) insula; (D, H) tergum IX.

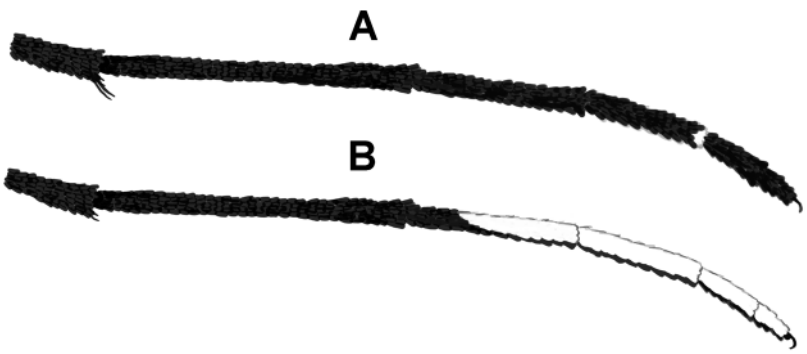

FIGURE 6. Female midleg tarsomeres 1–5, anterior surface aspect: (A) *Wyeomyia intonca*; (B) *Wyeomyia chocoensis* .

Discussion

Wyeomyia intonca and *Wy. chocoensis* are readily differentiated, not only from each other, but also from other species in the subgenus *Hystatomyia*, on the basis of distinctive characteristics associated with the male genitalia. Prominent among these is the peculiar gonostylus, which is located subapically on the mesal surface of the gonocoxite. Rather sausage-shaped in outline but flat, the gonostylus of *Wy. chocoensis* differs strikingly from those of other *Hystatomyia* species indigenous to lowland habitats west of the Andes. Although exhibiting distinct interspecific differences, the gonostylus of most species tends to be quite narrow over at least basal 0.5, and then usually widens, becoming more or less triangular shaped near apex. The gonostylus of *Wy. intonca* exemplifies the latter, but distally it is much broader than that of other described species. *Wyeomyia intonca* and *Wy. circumcincta* have 3 basomesal setal clusters; however, *Wy. chocoensis*, *Wy. coenonus*, and apparently *Wy. esmeraldasi*, have 2 clusters. Significant interspecific differences occur with regard to both number and shape of setae comprising these clusters. For example, one of the basomesal setal clusters of *Wy. intonca* is characterized by 11–15 strong setae with curved spathe-like apices while the corresponding cluster in *Wy. circumcincta* consists of about 9 slender lanceolate setae. Species-specific characters also may be associated with the slender distal portion of the gonocoxite. Thus, *Wy. chocoensis* has long, recurved, yellowish setae along the mesal surface of the slender distal portion of the gonocoxite, a character perhaps unique to this species.

In addition to differentiating characters associated with their genitalia, males tend to have other species-specific phenotypic differences. For example, the posteroventral surface of midtarsomeres 1 and 2 (Ta-$II_{1\&2}$) of *Wy. chocoensis* is entirely white scaled; in contrast, *Wy. intonca* has dark scaling ventrally on about distal 0.5 of Ta-II_1 and about basal 0.5 of Ta-II_2 and *Wy. circumcincta* (lectotype) has dark scaling ventrally on about basal 0.5 of Ta-II_1 and about basal 0.4 of Ta-II_2. Some variation exists with regard to setal color: the prealar setae of *Wy. intonca* are yellow and those of the postnotum pale (occasionally dark)

while the prealar setae of *Wy. chocoensis* tend to be amber or brown (occasionally yellow) and those of the postnotum, dark. Although the number of setae associated with specific areas of the pleura was quite similar for both *Wy. intonca* and *Wy. chocoensis*, density of setae on tergum VIII differed markedly, ranging from 38–41 in *Wy. intonca* and 72–90 in *Wy. chocoensis*.

The most striking difference between females of *Wy. intonca* and *Wy. chocoensis* appears to be the extent of white scaling on the midtarsomeres. Thus, Ta-$II_{2–4}$ of *Wy. chocoensis* have extensive white scaling with dark scales primarily limited to the ventral surface; whereas, in *Wy. intonca* these tarsomeres are covered with dark scales having a shiny metallic reflection—a few pale or white scales may be present near basal and/or distal ends of the tarsomeres. White scaling on the ventral surface of the proboscis is more pronounced in females of *Wy. chocoensis* than in *Wy. intonca* where it may be limited to a preapical patch (some specimens also have a narrow line of white scales extending from base of proboscis to preapical patch of white scales). Subtle differences appear to exist with regard to the female genitalia and number of setae associated with sternum VIII and tergum VIII, but this should be confirmed with additional observations.

Fourth-instar larvae of *Wy. intonca* and *Wy. chocoensis* differ in several respects. For many multi-branched setae, the number of branches is distinctly greater in *Wy. chocoensis* than *Wy. intonca*—the range for number of branches often being mutually exclusive or nearly so between the two species (Tables 2 and 4). Examples include seta 1 for the three thoracic regions as well as for abdominal segments I–VII, seta 5 for abdominal segments III–V, and seta 9 for abdominal segments IV–VII. In addition, seta 2 of the first abdominal segment (2-I) is seldom more than 2-branched in *Wy. intonca* but is usually at least 3-branched in *Wy. chocoensis*. Diagnostic differences between *Wy. intonca* and *Wy. chocoensis* also are associated with the siphon. Although length is arguably a weak character, the siphon of *Wy. intonca* (mean, 1.17 mm) is usually somewhat longer than that of *Wy. chocoensis* (mean 0.95 mm) with little overlap in their respective ranges. The siphon index for *Wy. intonca* (mean 8.2) tends to be larger than that for *Wy. chocoensis* (mean 7.3); however, some overlap exists in the ranges. The siphon of *Wy. intonca* tends to be somewhat curved distally and has a subapical area of darker pigmentation. Conversely, the siphon of *Wy. chocoensis* is straight or very slightly curved distally and is quite uniform in color. The two distal-most dorsal accessory setae (2a-S) of *Wy. chocoensis* are 2-branched (infrequently single or 3-branched), and often the third and fourth setae from the distal end also are 2-branched; whereas, these setae are unbranched in *Wy. intonca*, occasionally one may be forked near the tip. The basal-most dorsal accessory seta of *Wy. chocoensis* is usually shorter than setae immediately distal to it, e.g., often ~ 0.85 length of the third and fourth setae from the base; however, in *Wy. intonca* it is approximately the same length as these setae. While the mean number of ventral accessory setae (14) is the same for both species, *Wy. chocoensis* usually has more dorsal accessory setae (mean 21, range 17–26) than *Wy. intonca* (mean 17, range 11–19).

Diagnostic characters for differentiating the pupal exuviae of *Wy. intonca* and *Wy. chocoensis* may be derived from color pattern, shape of male genital lobe, and, to a lesser degree, chaetotaxy where most differences are subtle. A distinctive difference is the presence in *Wy. chocoensis* of a pale/clear spot on the distolateral margin of the metathoracic wing (the narrow portion of the metathoracic wing adjacent to the lateral margins of abdominal segment I), which in *Wy. intonca* is often barely perceptible, being only slightly paler than overall coloration of the metathoracic wing. Also, abdominal tergum I of *Wy. chocoensis* has three distinct pale spots, the most prominent associated with seta 6,7-I; the other two spots associated with seta 3-I and 4,5-I. In contrast, corresponding pale spots in *Wy. intonca* are much weaker, especially those associated with 3-I and 4,5-I, which are usually faint or not apparent. Although the trumpet of *Wy. intonca* tends to be slightly longer than that of *Wy. chocoensis*, considerable overlap exists in their ranges. A more significant difference appears to be in the coloration of the medial portion of the trumpet, which is very pale in *Wy. chocoensis*. While length of the male genital lobe is similar in both species, width is narrower in *Wy. chocoensis* resulting in distinctive *l:w* ratios—a mean of 1.14 (range 1.11–1.16) for *Wy. intonca* and of 1.30 (range 1.23–1.37) for *Wy. chocoensis*. Shape of the distal margin of the male genital lobe also differs somewhat between the two species. In spite of their overlapping ranges, abdominal seta 1-I usually has 13–17 branches in *Wy. chocoensis* and 18–21 in *Wy. intonca*. Other differences associated with setae include abdominal seta 3-I single (infrequently double) in *Wy. chocoensis* but usually 2-branched in *Wy. intonca* and seta 5-I single, seldom 2-branched, in *Wy. intonca* and 2 or 3-branched in *Wy. chocoensis*. Also, seta 9-I of *Wy. intonca* exists mainly as a very small puncture, occasionally with a minute single or 2-branched seta; whereas, in *Wy. chocoensis* it is relatively prominent and usually unbranched.

The attenuated apex of the male genital lobe of *Wy. circumcincta* as figured by Judd (1998) distinguishes the male pupal exuviae of this species from those of *Wy. intonca* and *Wy. chocoensis*. Also, the *l:w* ratio of the male genital lobe for the specimen of *Wy. circumcincta* available to us is 1.18, a value close to that observed for *Wy. intonca* but slightly beyond the upper range limit. Other potential characteristics of the pupal exuviae of *Wy. circumcincta* that may distinguish it from those of (1) *Wy. intonca* include a distinct pale/clear spot on the narrow distolateral portion of metathoracic wing (often barely perceptible in *Wy. intonca)*, abdominal seta 9-I with a distinct seta as opposed to often a puncture, and abdominal seta 1-IV 4-branched as opposed to 5-branched; and (2) *Wy. chocoensis* include abdominal seta 5-I single as opposed to double and abdominal seta 9-VIII 16–17-branched as opposed to 18–21-branched.

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