

TWO NEW SPECIES, LARVAL DESCRIPTIONS, AND LIFE
HISTORY NOTES OF SOME PANAMANIAN SAWFLIES
(HYMENOPTERA: ARGIDAE, TENTHREDINIDAE)

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Abstract.—Larvae are described and biological notes and hosts are presented for five species of Symphyta from Panama, two of which are new. Four species are argids: *Didymia unifasciata* Smith, n. sp. (on *Rouria glabra*), *Manaos kimseyae* Smith, n. sp. (on *Inga phagifolium*), *Sericoceros gibbus* (Klug) (on *Coccoloba manzanillensis*), and *Ptilia concinna* (Klug) (on *Cnestidium rufescens*). One species is a tenthredinid: *Erythraspides interstitialis* (Cameron), n. comb. (originally in *Monophadnus*) (on *Hamelia patens*). The larvae of each species and the adult characters for the two new species are illustrated.

Host plants and larvae of very few Neotropical sawflies are known. Four argids and one tenthredinid species were reared by the senior author from woody plants on Barro Colorado Island in the Zona del Canal, Panama. The larvae are described and available biological information on them is noted. The reared adults were identified by the junior author, who describes the two new species and supplies all the taxonomic information.

All specimens, except for a few paratypes, are deposited in the Entomology Museum of the University of California, Davis, and the National Museum of Natural History, Washington, D.C.

ARGIDAE

The following two new species are remarkably similar in general appearance and coloration, but belong to different genera. The length of the antenna will readily separate the two genera, that of *Manaos* being long, slender, tapering toward its apex, and its length more than twice the head width, and that of *Didymia* being short, mostly of uniform width throughout, with its length less than $1.5 \times$ the head width. Other differences between the two genera are as follows: the shape of the last closed cubital cell of the forewing, which is nearly square or slightly longer on the cubitus than on the radius in *Manaos*, and much longer on the radius than on the cubitus in *Didymia*; the sharp interantennal carina in *Manaos* and the rounded interantennal carina in *Didymia*; and the absence of or very short accessory vein at the apex of the radial cell in the forewing in *Manaos* and the long accessory vein in *Didymia*, which is nearly one-fifth the length of the radial cell. Both genera are separated from others in the Argidae by the following:

hindtibia without a preapical spine; tarsal claw simple; no intercostal vein in the forewing; radial cell of forewing closed at apex; anal cell present in hindwing; high interantennal carina present; and eyes large, converging below with the lower interocular distance less than the eye length.

Didymia unifasciata Smith, NEW SPECIES

Figs. 1-5, 11-19

Female.—Length, 7.0-9.5 mm. Antenna yellow, 3rd segment gradually changing to brown toward apex. Head black, area between and below antennae, clypeus, and mouthparts yellow; apex of mandible dark reddish. Thorax yellow, mesosternum black with yellow line at center; mesonotum black with prescutum laterally, lateral margins of lateral lobes, and posterior $\frac{1}{3}$ - $\frac{3}{4}$ of scutellum yellow. Abdomen yellow with apical 3 segments and sheath black. Legs yellow with hindtarsus black and sometimes apical 2-3 segments of fore- and midtarsi brownish. Forewing and hindwing black at base and apex, with broad yellow band at center; stigma and veins yellow in yellow portion, veins black in black areas.

Antenna length $1\frac{1}{3}\times$ head width; 1st segment nearly $2\times$ longer than broad; 2nd segment slightly longer than broad; 3rd segment of nearly uniform width throughout, slightly tapering to rounded apex, in cross-section laterally flattened with indistinct carina on outer margin. Malar space linear; clypeus very shallowly circularly emarginated at center, labrum subtruncate; eyes large and converging below, lower interocular distance about $\frac{4}{5}$ eye length; maxillary palpus about $1\frac{2}{5}$ eye length; distances between lateral ocellus and eye, between lateral ocelli, and between lateral ocellus and hindmargin of head in ratio of 0.8:1.0:0.7; interantennal carina high and sharp, bisecting about upper $\frac{1}{3}$ of supraclypeal area; each mandible simple. Tarsal claw simple; hindbasitarsus slightly longer than remaining tarsal segments combined. Forewing with 3 cubital cells, last closed cell longer on radius than on cubitus, vein 3r-m strongly curved; accessory vein at apex of radial cell long, more than $\frac{1}{5}$ length of radial cell. Anal cell of hindwing about $\frac{1}{2}$ as long as petiole. Sheath (Figs. 2, 3) with blunt scopae; lancet in Fig. 1.

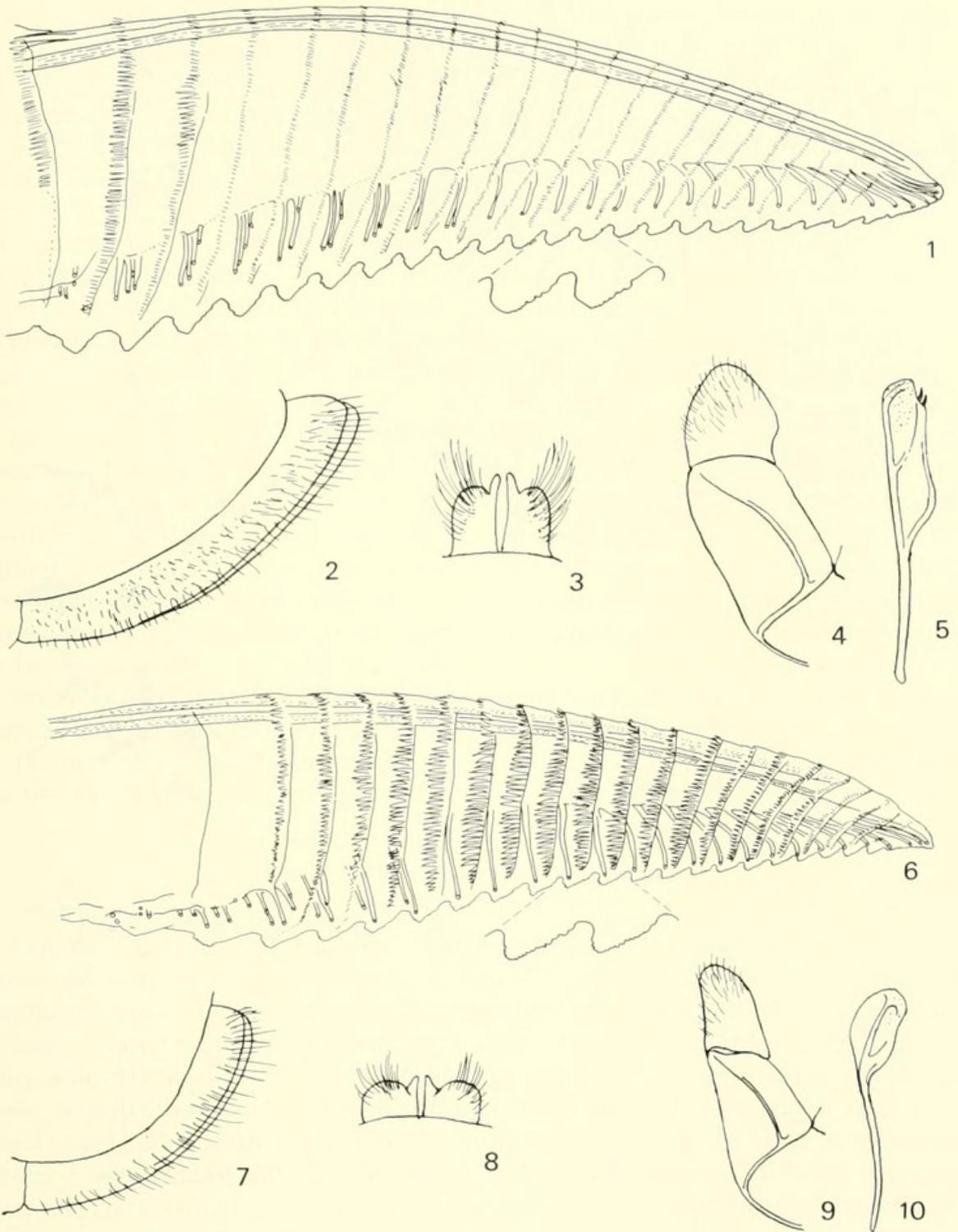
Male.—Length, 7.0 mm. Color and structure similar to female, except antennal length nearly $2\times$ head width and 3rd antennal segment furcate. Genitalia as in Figs. 4, 5.

Larva (ultimate instar).—Length, 16.0-17.0 mm. Head blackish, body pale yellow with long black tubercles, leg segments black.

Head with scattered short setae, becoming longer and more numerous between eyespot and mandible (Fig. 14); antenna a single, flat, circular segment; clypeus with 2 lateral setae; labrum emarginate medially, with 2 lateral setae; epipharynx with 10-13 setae in arcuate row on each lobe (Fig. 15); maxillary palpus 3-segmented, 1st segment with 1 seta, palpifer with 1 seta, lacinia with 2 apical setae (Fig. 16); labial palpus 2-segmented, prementum asetose; left mandible with 5 sharp teeth on outer cutting edge and large truncate cusp on inner cutting edge (Fig. 18); right mandible with 5 teeth on outer cutting edge and ridge on inner cutting edge (Fig. 19); each mandible with a single seta on outer surface.

Thorax strongly tuberculate (Figs. 11, 12); thoracic legs 5-segmented, with scattered setae on each segment. Midtarsal claw as in Fig. 17.

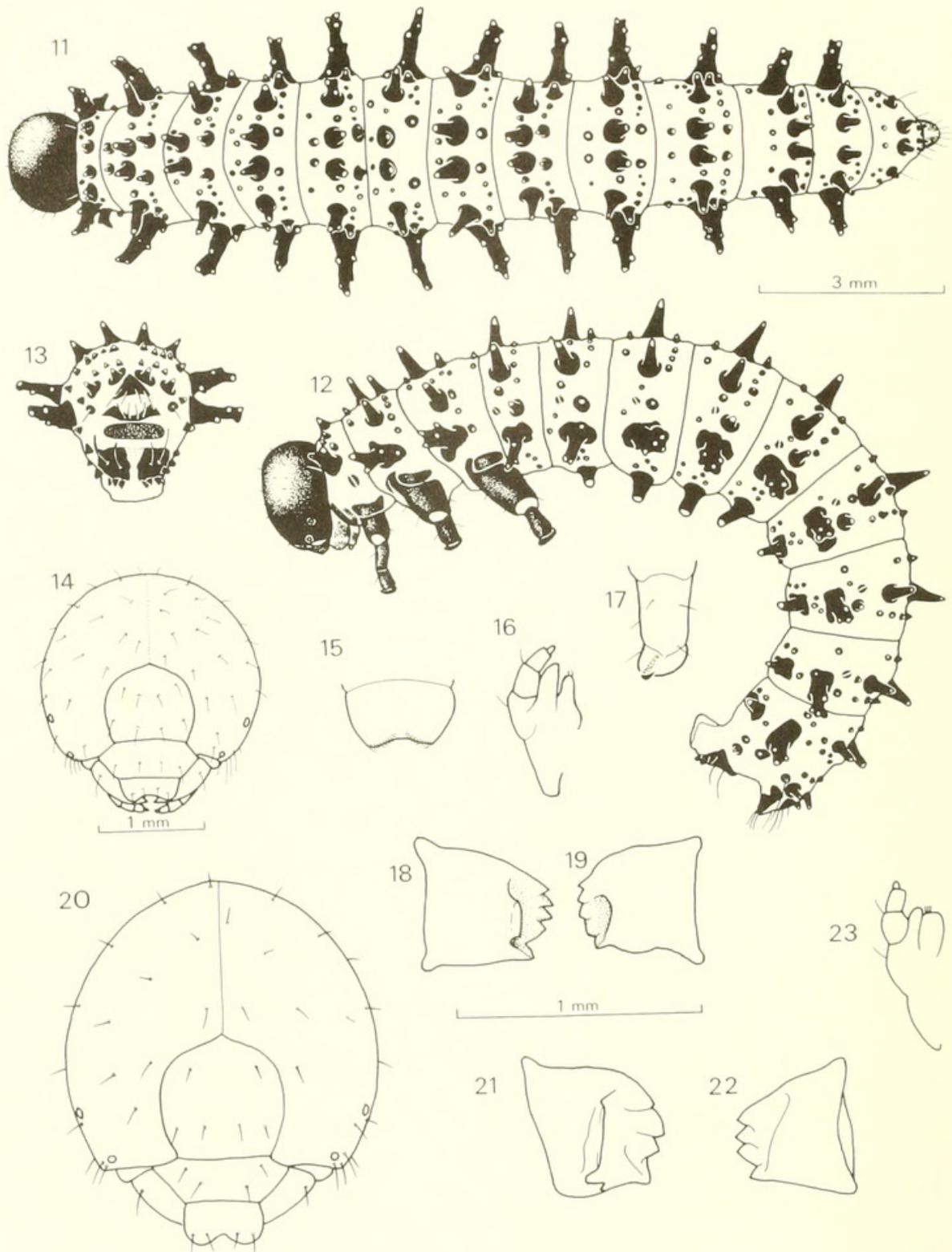
Abdominal segments 1-9 each with 3 faint annulets, tuberculate as in Figs. 11, 12; enlarged ventral tubercles in place of prolegs on segments 2-9; segment 10



Figs. 1-10. 1-5, *Didymia unifasciata*. 6-10, *Manaos kimseyae*. 1, 6, Female lancet. 2, 7, Female sheath, lateral views. 3, 8, Female sheath, dorsal views. 4, 5, 9, 10, Male genitalia. 4, 9, Left half of genital capsule, ventral view. 5, 10, Aedeagus.

produced into conical projection with triangular dorsal plate and 3 posterior plates, 4 apical tubercles in dorsal view (Fig. 13).

Holotype.—Female, from Panama, labeled “Trinidad Rio, Pan., 17 March 1912, A. Busck, coll.” In the National Museum of Natural History.



Figs. 11–23. 11–19, *Didymia unifasciata*, ultimate larva. 11, Body, dorsal view. 12, Body, lateral view. 13, Abdomen, posterior view. 14, Head, front view. 15, Epipharynx. 16, Left maxilla. 17, Midtarsus and claw. 18, Left mandible, inner surface. 19, Right mandible, inner surface. 20–23, *Ptilia concinna*, ultimate larva. 20, Head, front view. 21, Left mandible, inner surface. 22, Right mandible, inner surface. 23, Left maxilla.

Paratypes.—PANAMA: Same data as holotype (1 ♂); same data as holotype but 23 March 1912 (1 ♀), 19 March 1912 (1 ♀), 2 Jan. 1912 (2 ♀); Canal Zone Barro Colorado Is., 3 March 1963, C. W. and M. E. Rettenmeyer, taken in Malaise trap

(1 ♀); Decora B-O, 13 May 1953, Shannon traps, V. Alvarez (1 ♀); Barro Colorado Is. (BCI), Canal Zone, 10–12 May 1926, C. T. Greene (1 ♀); BCI, 12 Feb. 1929, S. W. Frost (1 ♀); BCI, 12 Feb. 1936, F. E. Lutz (1 ♀), same data except 9 Feb. 1936 (1 ♀); BCI, 24 July 1924, N. Banks (1 ♀); BCI, 2 April 1981, R. B. and L. S. Kimsey, ex *Rouria* sp. (1 ♀), same except 26 March 1981 and without host (1 ♀). Deposited in the National Museum of Natural History; University of California, Davis; American Museum of Natural History, New York; and Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts.

Host and life history.—Larvae were observed feeding singly on seedlings of *Rouria glabra* (Connaraceae) between April and August, 1981. The larvae fed primarily on the new flush leaves. Six individuals were reared; the period from cocoon formation to eclosion was 20 days at 23°C. The tachinid, *Vibrissina* sp., was reared from four cocoons.

Discussion.—The yellow coloration with most of the head, mesosternum, and apex of the abdomen black, and the bicolored wings with the single, broad, central yellow band are unique. This coloration and comparison of the lancet and genitalia with Figs. 1, 4, and 5 will distinguish this new species from other species of *Didymia*. Most other species are all orange or yellow, some have an entirely black abdomen, and most have uniformly blackish wings. The few species that do have bicolored wings have black at the base, center, and apex, with two yellow bands in between.

Didymia includes about 12 species and occurs from Panama to southern Brazil. Larvae and hosts of the other species are not known.

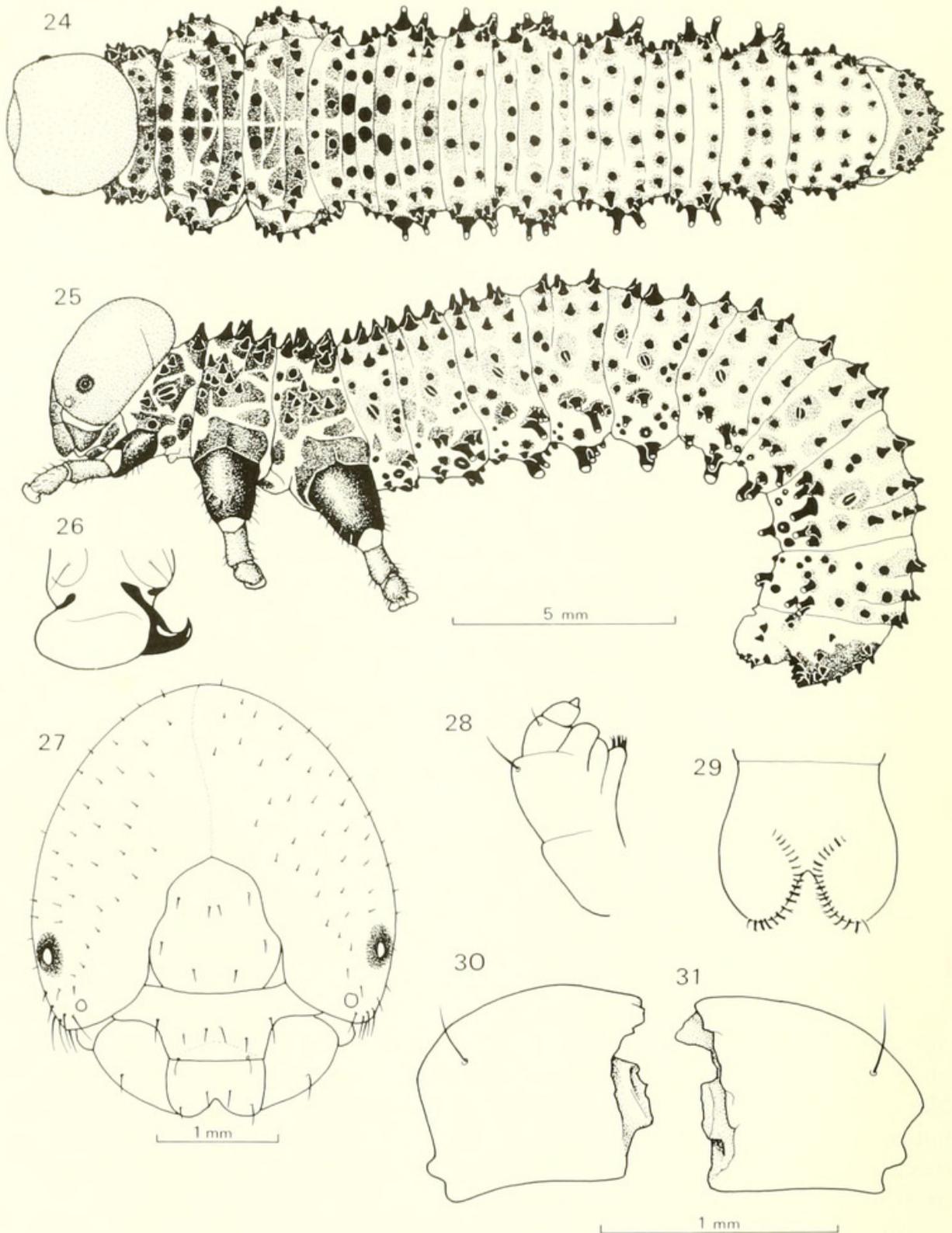
The species epithet alludes to the single yellow band of the forewing, from the Latin "unus" meaning one and "fascia" meaning band.

Manaos kimseyae Smith, NEW SPECIES

Figs. 6–10, 32–39

Female.—Length, 7.0–8.0 mm. Antenna yellow, 3rd segment changing to brownish near center and to black on apical $\frac{1}{2}$. Head black, area between and below antennae, clypeus, and mouthparts yellow; apex of mandible dark reddish. Thorax yellow, mesoscutum sometimes with 2 large or small black areas, mesonotum mostly black with prescutum laterally (entirely in 1 specimen) and extreme apex of scutellum black. Abdomen yellow with apical 3 segments and sheath black. Legs yellow with apical $\frac{1}{3}$ of hindtibia and all hindtarsus black; sometimes apical 3 segments of fore- and midtarsi black. Forewing and hindwing black at base and apex with broad yellow band at center; stigma and veins yellow in yellow portion, veins black in black portion.

Antenna length $2\frac{1}{3} \times$ head width; 1st segment $2 \times$ longer than broad; 2nd segment as long as broad; 3rd segment usually curved and tapering toward apex, round to oval in cross-section. Malar space linear; clypeus and labrum truncate; eyes large and converging below, lower interocular distance $\frac{3}{5}$ eye length; maxillary palpus long, $1\frac{3}{5}$ eye length; distances between lateral ocellus and eye, between lateral ocelli, and between lateral ocellus and hindmargin of head in ratio of 1.0:0.8:0.7; interantennal carina high, rounded, not bisecting supraclipeal area; each mandible simple. Tarsal claw simple; hindbasitarsus subequal to length of following segments combined. Forewing with 4 cubital cells, last closed cell longer



Figs. 24-31. *Sericoceros gibbus*, penultimate larva. 24, Body, dorsal view. 25, Body, lateral view. 26, Midtarsus apex and claw. 27, Head, front view. 28, Left maxilla. 29, Epipharynx. 30, Left mandible, inner surface. 31, Right mandible, inner surface.

on cubitus than on radius; small basal anal cell present; apex of radial cell without accessory vein or with very short stub. Hindwing with anal cell longer than its petiole. Sheath short, with stout laterally expanded scopae (Figs. 7, 8). Lancet as in Fig. 6.

Male.—Length, 6.1–7.0 mm. Color and structure similar to female except 3rd antennal segment furcate. Genitalia as in Figs. 9, 10.

Larva (penultimate instar).—Length, 16 mm. Head tan, eyespot pale, mandible darker; body yellowish, tubercles only slightly darker, coxae with dark brown medial stripe.

Head with scattered short setae, only slightly more numerous between eyespot and mandible (Fig. 34); antenna a single, round, flattened segment; clypeus with 2 lateral setae; labrum slightly indented medially, with 2 lateral setae; epipharynx with 8 spines in an arcuate pattern on each lobe (Fig. 37); maxillary palpus 3-segmented, segments without setae, palpifer large, palpifer and stipes each with 1 seta; lacinia with 5 spines (Fig. 35); labial palpus 2-segmented, prementum without setae; right mandible with 4 teeth on outer cutting edge and 2 on inner edge (Fig. 39); left mandible similar to right (Fig. 38); each mandible with 1 seta on outer surface.

Thorax strongly lobate, tuberculate as in Figs. 32, 33; legs short and somewhat reduced, 5-segmented; midtarsal claw as in Fig. 36.

Abdominal segments 1–9 each with 3 indistinct tuberculate annulets, appearing winged in dorsal view (Figs. 32, 33); short rounded prolegs on segments 2–7, all about same size; tergum 10 with 10 tubercles around apical margin.

Holotype.—Female, Panama, labeled “Canal Zone, Pan., Barro Colorado I., IX-1-1981, R. B. and L. S. Kimsey,” “Larva collected: *Inga phagifolium*, pupation VIII-17-1981, eclosion VIII-31-1981.” At the University of California, Davis.

Paratypes.—PAMANA: Same data as holotype (3 ♂); BCI, 12 May 1981, R. B. and L. S. Kimsey (1 ♀), BCI, 21 Sept. 1976 (1 ♀); Panama Prov., Cerro Jefe, 18 Sept. 1976, R. B. and L. S. Kimsey (1 ♀); BCI, 24 July 1968, D. Q. Cavagnaro and M. E. Irwin (1 ♀); BCI, 7 Jan. 1929, C. H. Curran (1 ♀); BCI, 14 March 1929, S. W. Frost (1 ♀); Cabima, 24 May 1911, A. Busck (1 ♀). Deposited in the University of California, Davis; California Academy of Sciences, San Francisco; American Museum of Natural History, New York; and National Museum of Natural History.

Host and life history notes.—Four larvae were reared from *Inga phagifolium* (Leguminosae) in August, 1981. Approximately 20 larvae were observed feeding singly on the younger leaves of a 0.5 m tall seedling. Mature larvae construct fuzzy, loosely spun, amber-colored cocoons on small stems on the plant. Eclosion occurred in 14 days at 23°C.

Discussion.—The bicolored wings, the yellow and black color pattern (black on the head, mesonotum, mesosternum, and apex of the abdomen), and lancet and genitalia (Figs. 6, 9, 10) will distinguish this new species. Most other species of *Manaos* are entirely orange, or have a different orange and black color pattern, and have uniformly blackish wings.

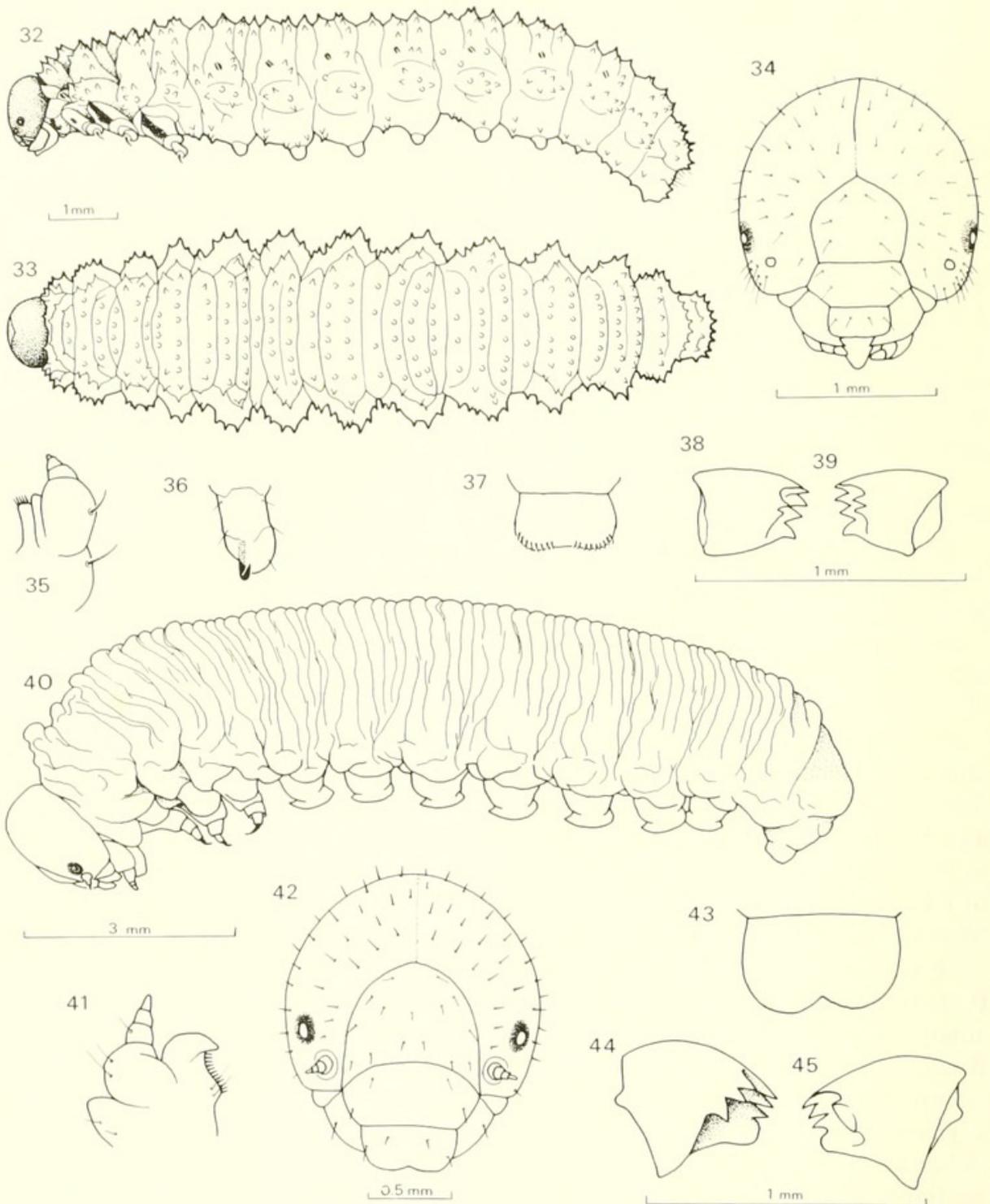
Species of *Manaos* occur from southern Mexico to northern Argentina. Most of the 13 described species are from the Amazon Basin of Brazil and Peru. Larvae and hosts are not known for other species.

The species is named for Lynn Kimsey who collected and reared the species.

Sericoceros gibbus (Klug)

Figs. 24–31

Larva (penultimate instar).—Length, 25–26 mm. Head dark brown, eyespot and clypeus black, mandible black with pale medial spot; body greenish, with dark plates and black tubercles; femora blackish.



Figs. 32-45. 32-39, *Manaos kimseyae*, penultimate larva. 32, Body, lateral view. 33, Body, dorsal view. 34, Head, front view. 35, Right maxilla. 36, Midtarsus apex and claw. 37, Epipharynx. 38, Left mandible, inner surface. 39, Right mandible, inner surface. 40-45, *Erythraspides interstitialis*, ultimate larva. 40, Body, lateral view. 41, Left maxilla. 42, Head, front view. 43, Epipharynx. 44, Left mandible, inner surface. 45, Right mandible, inner surface.

Head with scattered short setae, longer and more numerous between eyespot and mandible (Fig. 27); antenna a single, round, flat segment; clypeus with 4 lateral setae; labrum strongly emarginate medially, with 2 lateral setae; epipharynx with 19 apically bifurcate spines arranged in an arcuate row on each lobe (Fig. 29); maxillary palpus 3-segmented, 1st segment and palpifer each with 1 seta;

lacinia with 3 apically bifurcate spines (Fig. 28); labial palpus 2-segmented, prementum with 3 setae; left mandible badly worn, with apparently 2 apical teeth on outer cutting edge and large truncate cusp on inner edge (Fig. 30); right mandible with 2 teeth on outer cutting edge and large cusp in inner edge (Fig. 31); each mandible with a single seta on outer surface.

Thorax strongly tuberculate (Figs. 24, 25); thoracic legs large, each 5-segmented, with scattered setae on each segment. Midtarsal claw as in Fig. 26.

Abdominal segments 1–9 each with 3 annulets, tuberculation as in Figs. 24, 25; ventral tubercles enlarged with white tips, in place of prolegs on segments 2–9; tergum 10 with about 10 tubercles around edge of dark dorsal plate.

Host and life history notes.—Ten larvae were reared on *Coccoloba manzanilensis* (Polygonaceae) in July 1979, and 18 in August 1981. One clump of 13 eggs in a loose cluster was found attached to the under surface of a new leaf. Unlike *S. krugii* (Cresson), no female was observed guarding the eggs (Martorell, 1941). Larval feeding took 33 days and eclosion took 21 days. They fed gregariously along the leaf margin, holding the abdomen erect, away from the leaf margin. This posture has led to the Panamanian name of “Rabo al Honbro.” When disturbed they either waved the abdomen or curled it down against the leaf and secreted droplets of fluid from the coxal bases. The last larval instar was slightly smaller than the penultimate instar and had red thoracic segments. Larvae entered the leaf litter and constructed a thick brown silk pupal case attached to twigs and dried leaves. Mature male larvae are slightly smaller than mature female larvae and drop to the ground a week earlier.

Discussion.—*Sericoceros* includes about 15 species and occurs from the West Indies and Mexico south to Argentina. *Sericoceros gibbus* occurs from Mexico south to Brazil and Bolivia. Hosts and larvae are known for only two other species of *Sericoceros*, *S. krugii* from Puerto Rico and *S. edwardsii* (Cresson) from Honduras, both of which also feed on species of *Coccoloba* (Martorell, 1941; Smith, 1972). The larva of *S. krugii* differs from *gibbus* by having a broad black stripe on the head extending from the occiput to the clypeus, and the larva of *S. edwardsii* differs by having paler body tubercles more concolorous with the rest of the body.

Ptilia concinna (Klug)

Figs. 20–23

Larva (ultimate instar, shed skin).—Length about 16 mm. Head blackish, body pale yellow with long black tubercles; leg segments black.

Head with scattered short setae, becoming slightly more numerous between eyespot and mandible (Fig. 20); antenna a single, round, flat segment; clypeus with 2 lateral setae; labrum deeply emarginate medially, with 2 lateral setae; epipharynx with about 8 setae in arcuate pattern on each lobe; maxillary palpus 3-segmented, 1st segment and palpifer each with 1 seta, lacinia with 3 setae (Fig. 23); labial palpus 2-segmented, prementum of labium apparently without setae; left mandible with 4 teeth on outer cutting edge and truncate cusp on inner surface (Fig. 21); right mandible with 4 teeth on outer cutting edge, inner cutting edge simple (Fig. 22); each mandible with 1 seta on outer surface.

Thorax strongly tuberculate, closely resembling that of *Didymia kimseyae*; thoracic legs 5-segmented.

Abdominal segments 1–9 each with 3 faint annulets, tuberculations and anal plate closely resembling those of *Didymia kimseyae*.

Host and life history notes.—Four larvae were collected feeding singly on the new flush leaves of a seedling of *Cnestidium rufescens* (Connaraceae).

Discussion.—About 7 species of *Ptilia* are known from Mexico south to Brazil. *Ptilia concinna* occurs from Costa Rica to Brazil. Hosts and larvae for other species are not known.

TENTHREDINIDAE

BLENNOCAMPINAE

Erythraspides interstitialis (Cameron), NEW COMBINATION

Figs. 40–45

Monophadnus interstitialis Cameron, 1883: 24. ♀.

Larva (ultimate instar).—Length, 12–13 mm. Head whitish, body bluish gray becoming abruptly pale yellow ventrally. Penultimate instar: head tan, body dark gray above, pale yellow below.

Head with short scattered setae; antenna 4-segmented; clypeus with 2 lateral setae (Fig. 42); labrum medially emarginate, with 2 lateral setae; epipharynx apparently asetose (Fig. 43); maxillary palpus 3-segmented, 1st segment with 1 seta, stipes and palpifer each with 2 setae, lacinia with 13 spines (Fig. 41); labial palpus 3-segmented, prementum of labium with setae; left mandible with 3 sharp teeth and 1 rounded one on outer cutting edge, and 3 sharp teeth on inner edge (Fig. 44); right mandible with 3 sharp teeth and 1 rounded one on outer cutting edge, and truncate cusp on inner edge (Fig. 45); each mandible with 1 seta on outer surface.

Thoracic legs normal, 5-segmented.

Abdominal segments 1–9 each with 6 annulets, without setae or tubercles; tergum 10 without dark plate (Fig. 40).

Host and life history notes.—Eight larvae were reared from *Hamelia patens* (Rubiaceae). A female was observed ovipositing on a single leaf, inserting the eggs under the epidermis on the surface. After hatching, the larvae fed gregariously, starting at the tip of the leaf and working toward the petiole. They fed on the leaf blade but did not consume the midrib or other large veins. When not feeding, the larvae remained together in a cluster on the underside of the leaf. In the laboratory, last instar larvae were placed in a soil-filled petri dish where they burrowed in the soil and formed smooth-walled, silk-lined cocoons in the soil. At 25°C the period from hatching to cocoon formation was 15 days; adults emerged after 10 days.

Discussion.—*Erythraspides* includes about 10 species and is found from Canada to Central America. Hosts for only the two Nearctic species are known, *E. carbonarius* (Cresson) on *Oenothera* sp. and *E. vitis* (Harris) on *Vitis* sp. Only the larva of *E. vitis* has been described (Smith, 1969), and it differs from *interstitialis* by the long, conical, dark tubercles on the upper surface of the body. The identification and new combination are based on a study of Cameron's type in the British Museum (Natural History), London., by the junior author. The type is from "Panama, Volcan de Chiriqui, 2000 to 3000 feet."

ACKNOWLEDGMENTS

The field work for this study was done under the auspices and with the permission of the Smithsonian Tropical Research Institute. The tachinids reared from *Didymia* were identified by D. M. Wood, Biosystematics Research Institute, Ottawa, Ontario, who has retained the specimens. Our thanks to the following who loaned some of the specimens on which the descriptions of the two new species are based: M. Favreau, American Museum of Natural History, New York; M. K. Thayer, Museum of Comparative Zoology, Harvard University, Cambridge, Massachusetts; and Paul H. Arnaud, Jr., California Academy of Sciences, San Francisco. John Quinlan, British Museum (Natural History), London, England, allowed study of Cameron's type. Our thanks also to the following for their review of the manuscript: H. R. Wong, Canadian Forestry Service, Northern Forest Research Centre, Edmonton, Alberta, and D. R. Miller and A. S. Menke, Systematic Entomology Laboratory, USDA, Beltsville, Maryland and Washington, D.C., respectively. Figures 11-45 are by the senior author, figures 1 and 6 by M. L. Cooley, staff artist, Systematic Entomology Laboratory, USDA, Washington, D.C., and figures 2-5 and 7-10 by the junior author.

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