Character analysis of the Western Hemisphere genera of family Manicapsocidae (Psocoptera): genus *Epitroctes* reinstated with descriptions of four new species

Edward L. Mockford

Department of Biological Sciences 4120
Illinois State University
Normal, Illinois 61790-4120

Abstract: The characters of the named genera of family Manicapsocidae from the Western Hemisphere are reviewed: *Nothoentomum* Badonnel, *Phallopsocus* Badonnel, and *Epitroctes* Mockford. The synonymy of *Nothoentomum* and *Epitroctes* is refuted. Phenetically, *Epitroctes* stands closer to *Phallopsocus* than to *Nothoentomum*. Four new species of *Epitroctes* are described, one from Trinidad (West Indies), two from Costa Rica (one of these also recorded from Panamá), and one from Socorro Island, Mexico. A key to the known species of *Epitroctes* is included.

Introduction

The family Manicapsocidae was established (Mockford 1967) for the Zimbabweyan genus *Manicapsocus* Smithers (1965) and the tropical American genus *Epitroctes* Mockford. Later, Smithers (1972) assigned the Chilean genera *Nothoentomum* Badonnel (1967) and *Phallopsocus* Badonnel (1967) to this family. In the same work, Smithers synonymized the genera *Nothoentomum* and *Epitroctes*, but did not include the data on which this conclusion was based. In the present paper, I tabulate the differences among the named Western Hemisphere genera in order to re-evaluate their status. Four new species of *Epitroctes* (here treated as a valid genus) are described: one from Trinidad (West Indies), two from Costa Rica (one of these extending into Panamá), and one from Socorro Island, Mexico. A key to the known species of *Epitroctes* is included.

Procedure and Results: Comparison of Genera

Specimens of five species of *Epitroctes* were compared with detailed published information on *Nothoentomum* and *Phallopsocus* (Badonnel, 1967). Twelve characters were chosen (table 1) which have been used for describing these genera and which are not constant throughout this assemblage of genera. Most of the listed characters are self-explanatory, but the following notes are offered to clarify possible points of uncertainty.

Character 1 is the relative lengths of the fourth and second maxillary palpal segments. Characters 7 and 8, which reveal some important differences in relative sizes of head regions, require reference to Figures 1 and 2. Character 10 refers to the number of rami, here called parameres, arising on each side of the rachis of the phallic frame (example, Fig. 14). Character 12 is the length of the basal apodeme of the phallosome divided by the length of the frame (Fig. 7, b, f).

There are obvious points of similarity among these genera. These include a reduction in females' wings, the presence of a long basal apodeme of the phallosome, the presence of an axial rachis of the frame of the phallosome, a characteristic shape of the subgenital plate and its T sclerite, and the close proximity of the two distal lobes of v3. These characters suggest a close relationship among the three genera, but not synonymy between any two of them.

Of the twelve characters selected for comparison in Table 1, all reveal distinct structural differences between *Epitroctes* and *Nothoentomum*. Characters 5 and 6, dealing with wings, might be regarded as of less importance than the others because of the great variation found in these structures in psocids, but the type of wing dimorphism found in *Epitroctes* is obviously quite stable (see species descriptions, below). It is clear, then, that *Epitroctes* and *Nothoentomum* are markedly distinct entitites. *Epitroctes* is a genus of several species of the tropical lowlands of Mexico, Central America, and northern South America, while *Nothoentomum* is a Chilean genus, perhaps monotypic. *Epitroctes* and *Phallopsocus* are the same or very similar in characters 4, 7, 8, 10 and 11. They seem to be sufficiently different, however, in characters 1, 2, 3, 5, 6, 9, and

12, to warrant generic separation. Table 1 also suffices for differential diagnoses of these three genera.

New species of *Epitroctes*

In this section, four new species of *Epitroctes* are described and descriptive notes are included for *E. tuxtlarum* Mockford. All of the characters ascribed to this genus in Table 1 hold for all of the species and are not repeated in the descriptions. Male wings are clear and unmarked, other than for a slight smudge around the base of the pterostigma and another in the base of cell Cula of the forewing except in *E. sanguineus* new species (Fig. 19), where these markings are more distinct and other clouding is present. Wing venation is essentially uniform in males and is illustrated for only two species. For the other species, minor differences are described where they occur. Details of the lacinial tip, pretarsal claw, and hypandrium are the same for all of the species and are described only for the first one.

Differences among the species lie primarily in details of the structure of the phallosome (see below), details of color, relative length and ciliation of the female winglet, ciliation of the subgenital plate and shape of its T sclerite, details of the spermatheca (described below) and the 'spermatophores' contained therein, and ciliation of the epiproct. Intraspecific variation in characters observed only in slide preparations (details of phallic frame structure, ciliation of the epiproct and winglet) has been studied only in *E. tuxtlarum*, due to small sample sizes of the other species. In *E. tuxlarum*, phallosomal details are quite constant, while the number of distal setae of the epiproct varies enough to bring the reliability of that character (see below) into question.

The phallosome in *Epitroctes* consists of a complex frame on the distal end of a long apodeme. The frame has a central rachis and a pair of arms on each side which arise from a common base. Here the arms are called dorsal and ventral parameres (Fig. 14, dp, vp). The ventral parameres are joined to the central rachis by a membrane within which pores are scattered. Each ventral paramere bears on its median margin distally a broad appendage (Fig. 14, ma.); the appendages of the two sides often meet on the midline of the frame. An index, derived as the length of the apodeme divided by length of the frame (Fig. 7, b/f), shows differences between species.

The spermatheca consists of an elongate, membranous sac with scattered small pores on its surface. Near the junction with its duct the sac undergoes a tight curve and becomes more heavily sclerotized, especially on the inner surface of the curve. The duct is slender, undergoes a series of labyrinthine coils on exiting from the sac, then runs straight for a short distance to open on the semimembranous ninth sternum. This sternum is more heavily sclerotized in a small circular or quadrate patch immediately surrounding the spermapore and bears a granular arc immediately above this small sclerotized field. Spermathecal sacs of inseminated females contain one to several elongate tubes with thick but fragile walls (spermatophores auct., esp. Klier, 1956), probably formed during copulation. These structures are usually found broken in the preparations. Their absence in virgin females and their fragility make them rather unreliable for species differentiation.

The epiproct in both sexes shows certain regularities in the distribution of setae (Fig. 8). A series of eight long setae is arranged in two transverse arcs near the distal margin (Fig. 8, setae #1-4). Occasionally, one of the setae lies outside the arc (as seta #3 in Fig. 8). There is another long seta basolateral to the outermost seta of each arc (Fig. 8, seta #5); this seta is relatively longer in females than in males. Distal to the arcs is a transverse row of shorter setae, most of which are based on the extreme distal margin. These show numerical differences between species. Basal to the arcs are scattered shorter setae which reach nearly to the base of the epiproct in some species while in others there is a wide basal bare area (Fig. 8).

Illustrations were made with a microprojector for wings or a drawing tube for other parts. The holotype and allotype were illustrated unless otherwise indicated in the figure legends. Measurements in microns are included for one individual of each sex of each species. Abbreviations for body parts used in the measurements and elsewhere are as follows: IO = least distance between compound eyes in front view; d = transverse diameter of compound eye in front view; f1-f3 = lengths of first to third flagellar segments; P4 = length of fourth segment of maxillary (= mx) palpus; FW = forewing length; HW = hindwing length; F = length of hind femur; T = length of hind tibia; t1-t3 = lengths of hind first to third tarsomeres.

Holotypes and allotypes of the new species will be deposited in the American Museum of Natural History, New York City (AMNH), except for those

of *E. sanguineus*, which will be placed in the Instituto de Biología, Universidad Nacional Autónoma de México, México, D.F (IBUNAM). Paratypes will be retained in the author's collection (ELM), currently housed in the Department of Biological Sciences, Illinois State University, Normal, IL.

A key to the known species follows the descriptions.

Epitroctes calypso, new species

Male color (in 80% ethyl alcohol 20 years). Compound eyes pale red; ocelli colorless. Remainder of head, thorax, and appendages reddish brown, but P4, all trochanters, base of hind femur, and median and distal band of each tibia white; f1 much paler than rest of flagellum. Wing veins pale reddish brown, membrane of forewing with reddish-brown wash, membrane of hindwing colorless. Preclunial abdominal segments pale reddish brown; terminal segments slightly darker.

Male structural characters. Median ecdysial line distinct in basal half of vertex, not visible beyond. Ocellar field slightly raised. Flagellum with numerous short, upright, wavy hairs. Lacinial tip (Fig. 3), pretarsal claws (Fig. 4) and wing venation (Figs. 5, 6) typical of the genus; in forewing cell Cu1a relatively low and long; vein 2A ending in membrane or joining 1A; very short, sparse setae on veins and margin. In hindwing vein 1A ending in membrane. Hypandrium with distal margin slightly curved, bearing numerous setae; remainder of hypandrium sparsely setose. Phallosome (Fig. 7) with frame relatively short and broad, index b/f = 2.68; central rachis slender at base, abruptly widening to form a broad plate distally; ventral parameres (Fig. 14, v p) much longer than dorsals (d p). Epiproct (Fig. 8) with broad median basal region lacking setae; numerous setae over rest of surface basad of arcs of longer setae; distal row of eight setae. Paraproctal sensorium with five trichobothria on weakly formed basal rosettes; band of setae across middle of paraproct with numerous long setae near median margin.

Male measurements. IO = 232; d = 179; IO/d = 1.30; f1 = 505; f2 = 325; f3 = 369; P4 = 161; FW = 2854; HW = 2182; F = 617; T = 962; t1 = 681; t2 = 97; t3 = 116.

Female color (preservation as for male). As described for male except in following: head and thorax pale reddish brown, much paler than brown regions of legs; flagellum banded basally with f1 white, base of f2 brown, distal half of f2 white, base of f3 brown, distal one-third of f3 white, remainder of flagellum brown. Membranes of winglets colorless, their veins and margins white. Basal 'saddle' of abdomen (Fig. 9, s) dark reddish brown.

Female structural characters. Median ecdysial line indicated by slight indentation at base of vertex, not otherwise visible. Ocelli totally absent. Flagellum with sparse, straight hairs slanting distally. Lacinial tip and pretarsal claws as in male. Fore winglet (Fig. 10) reaching slightly beyond base of saddle; single vein from wing base branching once near base, the two branches running parallel nearly to tip of winglet, with several setae along their length, also several setae in anal region of winglet and along distal margin. Distal half of subgenital plate (Fig. 11) bearing numerous setae; T sclerite with long, distinct arms. Ovipositor valvulae (Fig. 12) normal for the genus; v3 distinctly, though shallowly, bilobed at tip, both lobes broad and rounded. Spermathecal sac (Fig. 13) elongate, containing a coiled 'spermatophore', widening to become a broad sac distally. Spermapore a small round hole on a small hexagonal plate with roughened surface. Epiproct and paraproct as described for male, except as noted above for the arcs of longer epiproctal setae.

Female measurements. IO = 262; d = 213; IO/d = 1.23; f1 = 278; f2 = 191; f3 = 210; P4 = 171; FW = 434; F = 621; T = 798; t1 = 590; t2 = 99; t3 = 126.

Material examined. Trinidad, W.I.: Arima Parish: Asa Wright Nature Center, 3 January 1976, on trunks of buttressed trees, holotype male, allotype female, 4 male, 3 female paratypes and 4 nymphs (holotype, allotype, 1 male and 1 female paratypes to AMNH, remainder to ELM). Type locality, 5-6 January 1976, beating forest understory vegetation, 1 female paratype (ELM). Type locality, 6 January 1976, on trunks of forest trees, 2 male paratypes and 2 nymphs (ELM). All material collected by E. L. Mockford.

Epitroctes pluvialis, new species

Male color (in 80% ethyl alcohol 18 years). Compound eyes dull red. Head, thorax, legs, and antennae rusty brown but each tibia white at distal end. Wings unmarked, veins rusty brown; membrane with rusty brown wash. Preclunial abdominal segments reddish brown; terminal segments pale brown.

Male structural characters. Median ecdysial line distinct from base of vertex to ocellar field. Ocellar field slightly raised. Flagellum with nu-

merous slightly wavy hairs slanting distad. In forewing cell Cu1a of normal height for the genus; vein 2A ending in 1A. In hindwing vein 1A ending in wing margin. Phallosome with frame (Fig. 14) relatively long; index b/f = 2.02; central rachis relatively wide at base, broadening from there to form wedge with sides heavily sclerotized; ventral parameres longer than dorsals; median appendage of ventral paramere (Fig. 14, ma) heavily sclerotized on disto-lateral margin. Epiproct with scattered short setae over most of surface basad of arcs, with 13 distal setae. Paraproctal sensorium with seven trichobothria on weak basal rosettes and 2-3 short setae with no basal rosettes; a broad band of setae across middle of paraproct with longer setae near median margin.

Male measurements. IO = 362; d = 177; IO/d = 2.05; f1 = 490; f2 = 326; f3 = 330; P4 = 186; FW = 3651; HW = 2803; F = 747; T = 1170; t1 = 808; t2 = 128; t3 = 162.

Female color (in 80% ethyl alcohol 18 years). Comparable parts as described for male. Winglets clear with colorless veins and margins. Abdominal saddle dark reddish brown.

Female structural characters. Median ecdysial line visible but faint through most of vertex. Ocelli minute, unpigmented. Flagellum with sparse, straight setae slanting distad on f1-f4. Fore winglets (Fig. 15) reaching nearly to hind margin of saddle; single vein from base of winglet branching once near base; anterior branch visible most of length of winglet but posterior not quite reaching half length of winglet; row of setae along each vein continuing nearly to wing tip, also numerous setae along hind margin of winglet. Distal half of subgenital plate (Fig. 16) sparsely setose; T sclerite with short stem; arms short, poorly pigmented. Ovipositor valvulae (Fig. 17) normal for the genus, except distal aspect of v3 with only a minute dorsal lobe. Spermathecal sac (Fig. 18) elongate, wide distally; 'spermatophore' coiled once on itself distally, articulated in middle, a slender tube basally. Epiproct as described for male except arcs of long setae staggered, 12 distal setae. Paraproctal sensorium with six peripheral trichobothria on weak basal rosettes, two central setae longer and stouter than the peripherals and lacking basal rosettes, cross-band of setae below sensorium as described for male.

Female measurements. IO = 432; d = 149; IO/d = 2.90; f1 = 392; f2 = 211; f3 = 215; P4 = 182; FW = 537; F = 793; T = 946; t1 = 707; t2 = 109; t3 = 173.

Material examined. Costa Rica: Puntarenas Province: Monteverde, 25 June 1977, trunks of buttressed trees, holotype male, allotype female (AMNH), 1 male, 1 female paratypes and 6 nymphs (ELM). Material collected by E. L. Mockford.

Epitroctes sanquineus new species

Male color (in 80% ethyl alcohol 8 years). Compound eyes gray with reddish tint in upper one-third. Ocelli rimmed centripetally in dark red. Vertex and frons creamy white with two red spots antero-dorsally on vertex and a red mark around each antennal base; a pale gray longitudinal band through middle of vertex. Postclypeus gray; genae red. Antennae dusky brown; mx palpi pale brown, but P4 with a red band through middle. Thorax medium brown dorsally, paler around wing bases and along sutures; pleura red with brown sutures. Coxae brown with red bases; trochanters and bases of femora creamy yellow; femora brown beyond bases, but tips creamy yellow; all tibiae dark brown with colorless distal ends; middle and hind tibiae with median band of paler brown; each t1 dark brown basally, remainder of tarsi pale brown. Forewing (Fig. 19) with brown spot in base of pterostigma extending well into cell R1; veins Sc (closing pterostigma), R1 distally and R2+3 distally dark brown, the color emphasized with brown clouding in surrounding membrane; a brown spot in base of cell Cu1a; remainder of wing with veins medium brown except colorless in Rs-M crossvein and base of median fork; membrane clear with tawny brown wash. Hindwing clear with slight tawny brown wash. Abdomen: preclunial segments creamy yellow extensively marked with red subcuticular pigment (ventro-lateral band in each segment and broad bands of spotting on terga across base, middle, and distal end); hypandrium dusky brown; likewise clunium on sides, paler dorsally; epiproct and paraprocts variegated red and dusky white.

Male structural characters. Median ecdysial line distinct from base of vertex for ca. half distance to ocellar field, not visible farther forward. Ocellar field flat. Flagellum with numerous slightly wavy upright hairs. In forewing (Fig. 19) cell Cu1a relatively long but of normal height for the genus; vein 2A ending in 1A. In hindwing, first segment of Rs present (n=3) or absent (n=2); vein 1A ending in wing margin, but weak and unpigmented near margin. Phallosome (Fig. 20 in part): index b/f = 2.35; basal apodeme widened near base of frame; base of frame marked by an incision on each side; central rachis of frame relatively slender at base, broadening in middle to form Y-shaped

dorsals. Epiproct with scattered setae over entire surface; eight setae on distal margin. Paraproctal sensorium with 7-9 trichobothria on weakly-developed basal rosettes, 2-3 without basal rosettes; a wide band of setae across paraproct below sensorium.

Male measurements. IO = 291; d = 190; IO/d= 1.53; f1 = 531; f2 = 313; f3 = 307; P4 = 172; FW = 2999; HW = 2286; F = 727; T = 1062; t1 = 739; t2=112; t3 = 152.

Female color. Body and appendages as in male except three dusky brown longitudinal bands through vertex, one through middle and one bordering each compound eye; a pair of dusky brown spots on frons before ocelli. Winglets pale straw brown. Saddle dark brown, darkest along front and hind margins.

Female structural characters. Median ecdysial line visible through most of median brown band of vertex. Ocelli present with pigmented rims, but smaller than in male. Flagellum with sparse, long, straight setae, mostly in single rank along lower surface. Winglet (Fig. 21) extending to ca. half length of saddle; with two faint veins indicated beyond their bases by rows of setae; other setae sparse along margins and on membrane. Saddle flanked on each side by a ventro-lateral sclerite. Distal half of subgenital plate (Fig. 22) sparsely setose; T sclerite with long, well pigmented arms; short, broad stem. Ovipositor valvulae (Fig. 23): dorsal lobe of v3 slender, much shorter than ventral lobe. Spermatheca (Fig. 24) with sac elongate, curved in near circle at base with heavily sclerotized inner lip of opening. Epiproct sparsely setose, lacking setae in basal one-third, with eight setae on distal margin. Paraproctal sensorium with single long, median seta, 7-9 peripheral trichobothria of which only three with (weak) basal rosettes; broad band of setae across paraproct below sensorium.

Female measurements. IO = 323; d = 197; IO/d = 1.64; f1 = 339; f2 = 191; f3 = 200; P4 = 194; FW = 524; F = 739; T = 878; t1 = 652; t2 = 120; t3 = 158.

Material examined. México: Isla Socorro (18.45 N, 110.58W), 26 September 1988, Everman-Playa Blanca Road, 800 m, on tree trunks covered with lichens and mosses, coll. L. Cervantes, A. Cadena, and A. N. Garcia Aldrete, holotype male, allotype female, 6 male and 4 female paratypes and 70 nymphs; holotype, allotype, 5 male and 3 female paratypes in IBUNAM; 1 male and 1 female paratypes in ELM.

Note: The presence in some males and absence in others of the first segment of Rs in the hindwing is of interest. It suggests that caution must be employed in the use of this character for recognition of taxa above the species level in electrentomoid psocids.

Epitroctes sanvito Mockford, new species

Male color (in 80% ethyl alcohol 18 years). Compound eyes reddish brown; ocelli colorless. Remainder of head, all of thorax, legs and antennae pale reddish brown; tarsi somewhat darker than remainder of leg. Mx palpi white. Wing veins reddish brown; membrane with reddish brown wash. Abdomen colorless in cuticle except for pale brown saddle of first two terga; internal structures showing through as pale straw brown over rest of abdomen.

Male structural characters. Median ecdysial line visible in basal half of vertex, absent beyond. Ocelli small, anterior smaller than posteriors, the field not raised. Flagellum with sparse, straight setae slanting slightly distad. In forewing cell Cu1a of normal height for the genus; vein 2A consistently ending in 1A. In hindwing vein 1A ending in wing margin. Phallosome with frame (Fig. 25) relatively long; index b/f = 2.15; central rachis slender at base, gradually widening from ca. half its length to distal end to form shallowly excavated Y-shaped structure; dorsal parameres longer than ventrals. Epiproct setose over entire upper surface except for narrow basal area; 12 distal setae in staggered row. Paraproctal sensorium with 10 trichobothria on minute, vague basal rosettes, including one central trichobothrium stouter than others; broad band of setae across middle of paraproct from ventral end of sensorium nearly to ventral margin of paraproct, with longer setae near median margin.

Male measurements. IO = 296; d = 217; IO/d = 1.36; f1 = 475; f2 = 306; f3 = 308; P4 = 188; FW = 3306; HW = 2502; F = 699; T = 1085; t1 = 727; t2 = 117; t3 = 144.

Female color (in alcohol 18 years). Same as for male except flagellum colorless in basal two-thirds, pale grayish brown in remainder of length; abdomen pale reddish brown (cuticular pigment).

Female structural characters. Median ecdysial line developed as in male. Ocelli totally absent. Flagellum with sparse, straight hairs slanting distad. Fore winglet (Fig. 26) very short, reaching only to hind margin of thorax, oriented vertically along side of thorax; no veins visible in winglet, but two lines of stout setae diverging from a single line in basal one-third and running nearly to tip of winglet;

ly along side of thorax; no veins visible in winglet, but two lines of stout setae diverging from a single line in basal one-third and running nearly to tip of winglet; stout setae also along hind margin of winglet. Distal half of subgenital plate (Fig. 27) densely setose with numerous short setae along free margin; T sclerite with short, indistinct arms. Ovipositor valvulae (Fig. 28) normal for the genus; v3 distinctly bilobed with dorsal lobe somewhat slenderer than ventral lobe. Spermathecal sac (Fig. 29) elongate, containing a single 'spermatophore' developed as a long, slender, curved tube with a sac at distal end. Epiproct and paraproct as described for male, but only seven trichobothria on paraproctal sensorium; stouter median trichobothrium much longer than others; epiproct with nine distal setae.

Female measurements. IO = 323; d = 222; IO/d = 1.46; f1 = 285; f2 = 208; f3 = 211; P4 = 183; FW = 320; F = 654; T = 761; t1 = 534; t2 = 102; t3 = 140.

Material examined. Costa Rica: Puntarenas Province: Finca Las Cruces near San Vito, 20-21 June 1977, trunks of buttress-based trees, holotype male, allotype female, 7 male and 4 female paratypes and 5 nymphs (holotype, allotype, 2 male and 1 female paratypes to AMNH, other specimens to ELM). Type locality, 22 June 1977, beating understory vegetation in forest, 1 female paratype (ELM). All material collected by E. L. Mockford.

Note: Two females collected at Bambito, Chiriqui Province, Panamá, approximately 65 Km east of the type locality apparently represent this species. They differ from the types in having the flagellum uniformly brown. No other differences were noted.

Epitroctes tuxtlarum Mockford

Epitroctes tuxtlarum Mockford, 1967: 145.
Nothoentomum tuxtlarum (Mockford), Smithers 1972: 75.

In the original description, the dorsal paramere of each side is shown re-joining the ventral paramere via an arm branching from the dorsal paramere just beyond the middle of its length (Mockford 1967, Fig. 75). That is incorrect: the 'arm' is a well sclerotized inner edge of the vp running to the base of the median appendage (Fig. 30). The original figure of the ovipositor valvulae (Mockford, loc. cit., Fig. 77) fails to depict accurately the dorsal lobe of v3; the valvulae are illustrated here again (Fig. 32). The female's winglet and spermatheca with a spermatophore are also illustrated (Figs. 31 and 33 respectively). Two color forms were noted for this species: a red form, in which there is a red band the length of each thoracic pleuron above the leg bases, each coxa has a lateral red spot, each tibia has a red band in the basal one-third, and another in the distal one-third, the preclunial abdominal segments have on each side a broad, continuous ventrolateral red band and a narrower, segmentally divided dorso-lateral red band, as well as some dorsal red spotting (subcuticular pigment on abdomen); and a brown form lacking all of the red marks and with only vague brown or reddish brown banding on the tibiae. A search for morphological differences between the two forms revealed none.

Material examined. In addition to the material on which the original description was based, the following specimens were studied (all from the Tuxtlas Mountains of Veracruz, Mexico): type locality, 7-8 July, 1967, trunks of buttressed trees, 2 males, 2 females, 4 nymphs, coll. E. L. Mockford and J. Manzano; 5.6-6.4 Km. NW Santiago Tuxtla on road to Cerro El Vigía, 12 July 1973, trunks of buttressed trees, 3 males, 8 females, 7 nymphs, coll. E. L. Mockford; Los Tuxtlas Field Station (UNAM) near Montepío, 27 June 1979, trunks of large forest trees, 2 females, 1 nymph, coll. E. L. Mockford; same locality, 16 December 1984; trunks of buttressed trees, 7 males, 11 females, 25 nymphs, coll. E. L. Mockford and D. M. Sullivan.

Key to species of *Epitroctes*

1. Macropterous: wings extending beyond tip of abdomen and with complete venation (Fig. 5); ocelli well developed (Males) 2
— Brachypterous: winglets not extending beyond basal one-third of abdomen and with venation greatly reduced or absent (Fig. 9); ocelli absent or minute (Females) 6

2. Well pigmented and sclerotized area of central rachis of phallic frame only on midline of rachis (Fig. 7); P4 white; remainder of mx palpus brown .. .. *E. calypso* new species.
— Well pigmented and sclerotized area of central rachis of phallic frame forming a V or Y; mx palpus either all white or all brown 3

3. Mx palpus all white; vp < dp in length (Fig. 25) .... *E. sanvito* new species.
— Mx palpus brown; vp >/ ≡ dp in length 4

4. vp ≡ dp in length (Fig. 30); index b/f > 2.25 5
— vp > dp in length (Fig. 14); index b/f < 2.20 .... *E. pluvialis* new species.

5. Phallosomal apodeme gradually tapering from base of frame to middle; in forewing, veins Sc (closing pterostigma), R1, R2+3, and R4+5 not darkly pigmented at their marginal ends ..... *E. tuxtlarum* Mockford

— Phallosomal apodeme with broad parallel-sized area at base of frame, then gradually tapering to middle (Fig. 20); in forewing veins Sc (closing pterostigma), R1, R2+3, and R4+5 darkly pigmented at their marginal ends(Fig. 19) ..... *E. sanguineus* new species.

6. Mx palpi all white; winglets very short, not reaching beyond hind margin of thorax ..... *E. sanvito* new species.

— Mx palpi at least partially brown or red; winglets reaching beyond hind margin of thorax 7

7. P4 white, remainder of palpus brown or red; flagellum banded brown and white from base through f3; both lobes of v3 equal in width (Fig. 12) ..... *E. calypso* new species.

— P4 brown or red; flagellum not color-banded; dorsal lobe of v3 slenderer as well as shorter than ventral lobe (Figs. 17, 23, 32) 8

8. Ocelli with pigmented rims; arms of T sclerite long and distinct (Fig. 22) 9

— Ocelli totally unpigmented; arms of T sclerite short and indistinct (Fig. 16) ..... *E. pluvialis* new species.

9. Setae of flagellum primarily in a single rank on anterior = ventral surface. Saddle flanked by a ventro-lateral sclerite on each side ..... *E. sanguineus* new species.

— Setae of flagellum in several ranks with no single rank predominating. Saddle without ventro-lateral flanking sclerites ..... *E. tuxtlarum* Mockford.

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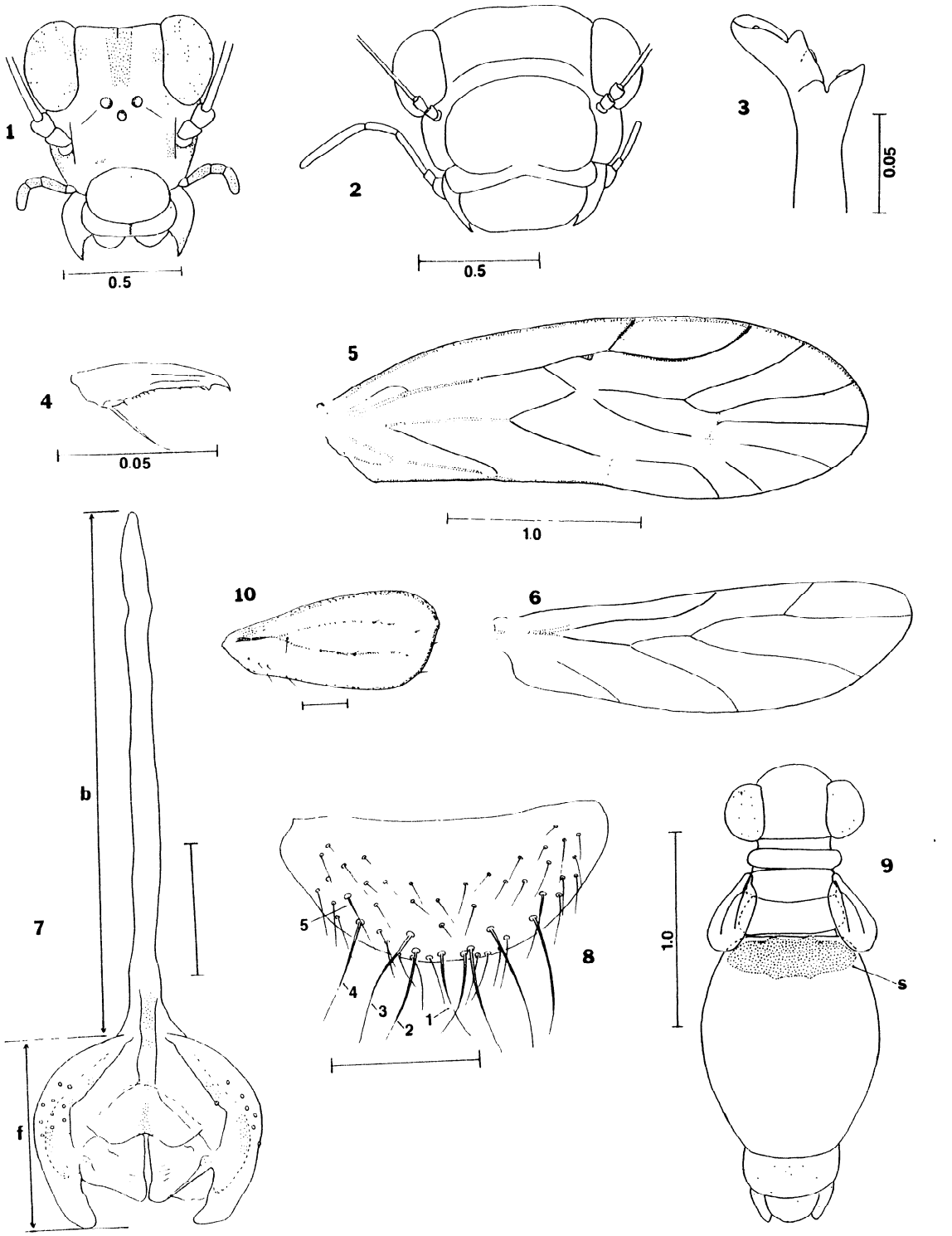
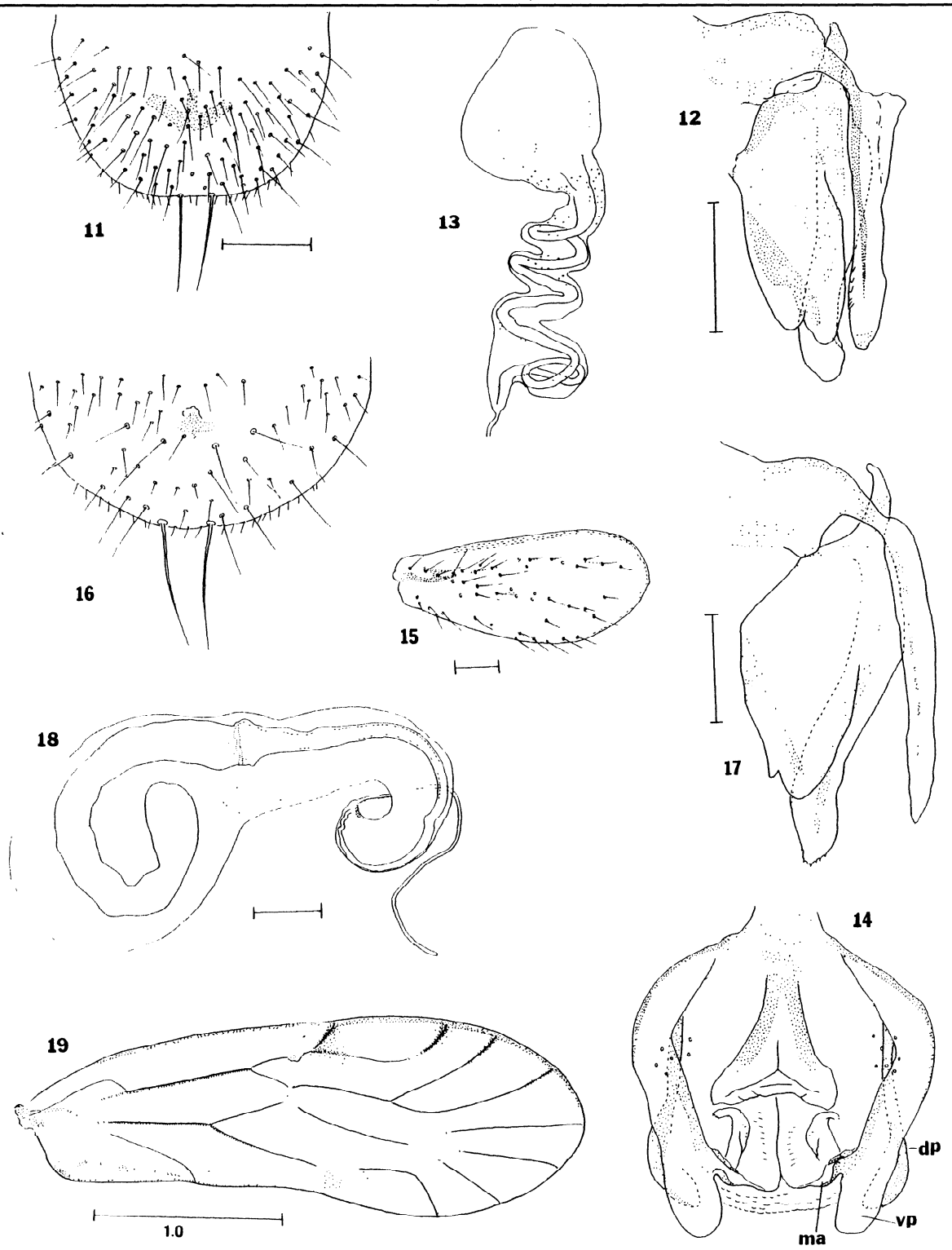
Table 1: Comparison of named Western Hemisphere genera of Manicapsocidae

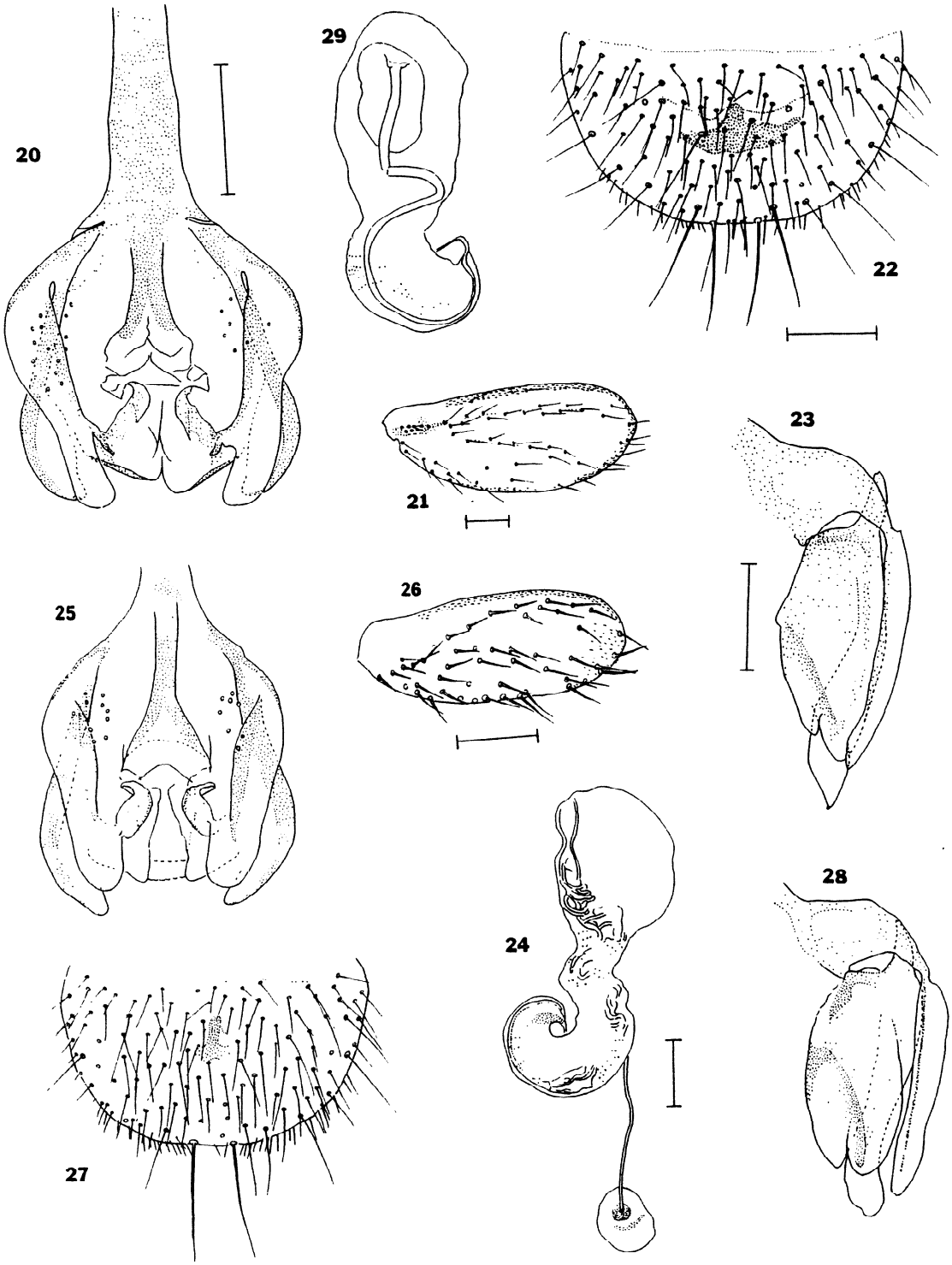
Character	*Nothoentomum*	*Epitroctes*	*Phallopsocus*
1. P4>/=/<P2	P4>P2	P4<P2	P4=P2
2. Coxal organ	Absent	Mirror present	Outline of rasp present
3. L/basal w, outer cusp of lacinial tip	1.9	2.6	2.0
4. Preapical denticle of pretarsal claw	Absent	Large	Small
5. Wings male	Reduced: long articulated pad with single vein;	Macropterous, full venation;	Absent
6. Wings female	Short lateral scales, non-articulated, no veins;	Short lateral scales, articulated, showing 2 veins;	Absent
7. Frons	Reduced; head short dorsoventrally;	Wide, head elongate;	Wide, head elongate;
8. Postclypeus	Large & bulbous;	Short, not much protruding;	Short, only slightly protruding;
9. Basal abdominal terga	First 2 terga separately sclerotized;	First 2 terga sclerotized together;	First 2 terga not sclerotized;
10. Phallosome: # parameres	Single paramere on each side;	2 parameres on each side;	2 parameres on each side;
11. Liaison sclerites, phallosome to hypandrium	Present	Absent	Absent
12. b/f index (see text)	1.20	2.02-2.94	0.30



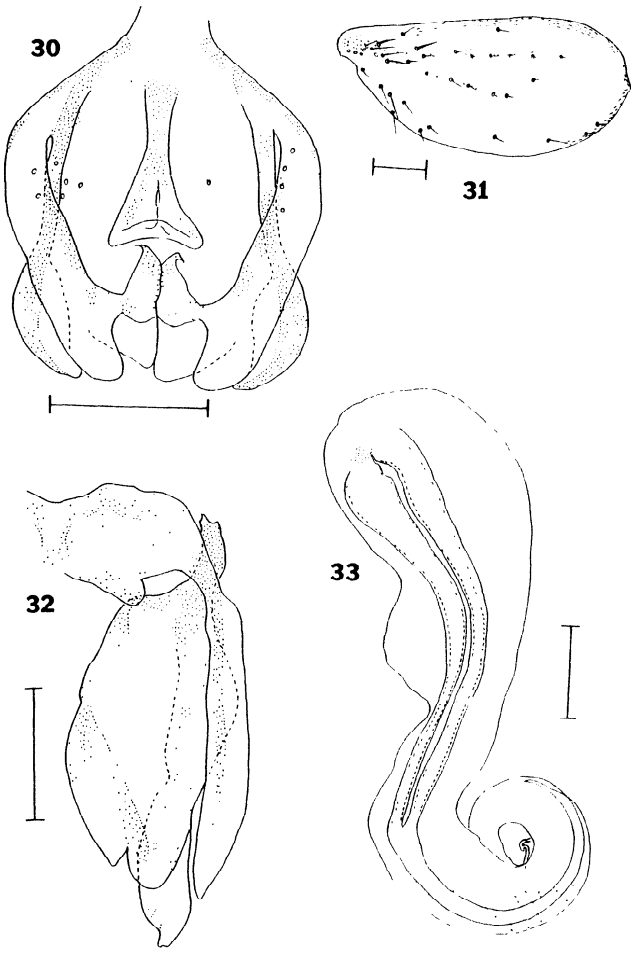
Figs. 1-10. *Epitroctes* spp. and *Nothoentomum* sp. 1. *E. sanguineus* new species, male paratype, head in face view. 2. *N. palpalis* Badonnel, male, head in face view (re-drawn from Badonnel, 1967). 3-10. *E. calypso* new species. 3. Male, lacinial tip. 4. Male, hind pretarsal claw. 5. Male, forewing (the faint rs-m crossvein is an anomaly present only in the right wing). 6. Male, hindwing, scale of Fig. 5. 7. Male, phallosome (b,f = measurements for index b/f). 8. Male, epiproct (setae 1-5 numbered). 9. Female paratype, dorsal habitus, appendages not shown (s= saddle). 10. Female, winglet. Scales = 0.1 mm unless otherwise noted.



Figs. 11-19. *Epitroctes* spp. 11-13. *E. calypso* new species, female. 11. Distal segment of subgenital plate. 12. Ovipositor valvulae. 13. Spermathecal sac, scale of Fig. 12. 14-18. *E. pluvialis* new species. 14. Male, phallic frame, scale of Fig. 12 (dp, vp = dorsal and ventral parameres; ma = median appendage). 15. Female, winglet. 16. Female, distal segment of subgenital plate, scale of Fig. 11. 17. Female, ovipositor valvulae. 18. Female, spermathecal sac and part of duct. 19. *E. sanguineus* new species, male, forewing. Scales = 0.1 mm unless otherwise noted.



Figs. 20-29. *Epitroctes* spp. 20-24. *E. sanguineus* new species. 20. Male, phallic frame and base of apodeme. 21. Female, winglet. 22. Female, distal segment of subgenital plate. 23. Female, ovipositor valvulae. 24. Female, spermathecal sac and part of duct. 25-29. *E. sanvito* new species. 25. Male, phallic frame, scale of Fig. 20. 26. Female, winglet. 27. Female, distal segment of subgenital plate, scale of Fig. 22. 28. Female, ovipositor valvulae, scale of Fig. 23. 29. Female, spermathecal sac, scale of Fig. 24. Scales = 0.1 mm unless otherwise noted.



Figs. 30-33. *Epitroctes tuxtlarum* Mockford. 30. Male topotype, phallic frame. 31. Female topotype, winglet. 32. Female topotype, ovipositor valvulae. 33. Female topotype, spermathecal sac. Scales = 0.1 mm.