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PSOCOPTERA OF THE GALAPAGOS ISLANDS

By **Ian W. B. Thornton**[1] and **Anita K. T. Woo**

Abstract: The psocopteran fauna of the Galapagos is reviewed comprehensively for the first time. Treated are 39 species, of which 18 are described as new. Numerous illustrations of the new species are presented. Distribution and faunal affinities of these psocopterans are discussed.

INTRODUCTION

The Galapagos Archipelago is situated on the equator about 960 km west of Ecuador. It consists of five large islands, which in decreasing order of their area are Albemarle, Indefatigable, Narborough, James and Chatham, eleven smaller islands and numerous islets and rocks. All the islands are volcanic and the volcanoes on some of them are still active. The latest eruption was reported on Narborough on May 11, 1968. According to Chubb (1933), Richardson (1933), Cox & Dalrymple (1966), and Wilson (1963), the Galapagos appear to be rather young as a whole and originated probably in the late Miocene (15 million years ago), with the southeastern islands older than the rest.

Although the archipelago lies in the equatorial region, its climate is cool from June to December due to the Humboldt Current flowing through the archipelago from east to west as the South Equatorial Current. During this period the southeast trade winds prevail, bringing little rain, but a fine mist occurs at higher elevations. For the rest of the year the cold current is replaced by a warmer current "El Niño", coming from the Panama area, and during this season there may be spasmodic heavy rainfall and storms, and temperatures are higher.

There has been much dispute as to whether the Galapagos are continental or oceanic in origin, Baur (1891), Scharff (1912), Van Denburgh and Slevin (1913), Beebe (1924), and Van Dyke (1953) holding the former view and Darwin (1845), Stewart (1911), Lack (1947), and Carlquist (1965) holding the latter. Most biologists now accept an oceanic origin on the grounds of biological and geological evidence.

When Charles Darwin visited the Galapagos in 1835, he remarked that the insect fauna of the archipelago was very poor and had a more desert than tropical character. This is in accordance with the arid nature of the lowlands. Most of the insects are related to those in Central or South America; examples can be found in Hemiptera (Van Duzee, 1933), Embioptera (Ross, 1966), Coleoptera (Van Dyke, 1953), Cerambycidae (Linsley

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& Chemsak, 1966), Otitidae (Steyskal, 1966), Calliphoridae (James, 1966), Hippoboscidae (Bequaert, 1933), Isoptera (Light, 1953), and Thysanoptera (Bailey, 1967).

Examples of the differentiation of Galapagos insects into distinct island species and subspecies may be found in ants, particularly the genus *Camponotus* (Linsley & Usinger, 1966), the acridiid genera *Sphingonotus*, *Schistocerca* and *Halmenus* (Linsley & Usinger, 1966, many subspecies of *Schistocerca* and all of *Sphingonotus* not accepted by Hebard, 1920), the tettigoniid genus *Liparoscelis* (Linsley & Usinger, 1966), several genera of carabid, elaterid, tenebrionid and curculionid beetles (Linsley & Usinger, 1966), cerambycid beetles (Linsley & Chemsak, 1966), and blowflies (James, 1966).

Cosmopolitan species usually show no divergence from parental stock nor do they form endemic complexes for they have good means of dispersal and can colonize new environments easily. The frequency of landfall is probably high enough to maintain genetical contact with the parental population and hence the original gene pool is maintained and divergence prevented. Other species, usually those with close relatives on the continent, are subspecifically or specifically distinct from their progenitors, showing that migration to the Galapagos Islands has not been always frequent or often successful. The scanty number of species compared to the rich fauna on the continent gives some support to the theory that the Galapagos are oceanic, colonization being accomplished mainly through chance agencies.

Psocoptera were not mentioned in Linsley & Usinger (1966) as having been found on the Galapagos Archipelago. Since then, two species of the family Ectopsocidae (Thornton & Wong, 1968) and one species of the family Pseudocaeciliidae (Lee & Thornton, 1967) have been identified in general collections made there.

MATERIAL

The specimens upon which this study is based were collected by I. W. B. T. in the Galapagos Islands from January to June, 1967. All the 16 islands were visited, often repeatedly, Indefatigable and Albemarle being the most extensively covered. About 5000 specimens were collected. The duration of collecting on each island is listed below. Abbreviations refer to Fig. 22.

Island	*Number of collecting days spent on island*
Culpepper (Cu)	1
Wenman (Wm)	2
Abingdon (Ab)	4
Bindloe (Bl)	2
Tower (T)	4
Narborough (N)	7
Albemarle	14
Volcan Wolf (Wf)	(2)
Volcan Darwin (D)	(3)
Volcan Alcedo (A)	(2)
Sierra Negra (St)	(5)
Cerro Azul (Ca)	(2)
Brattle (Br)	1
James (J)	5

Island	*Number of collecting days spent on island*
Jervis (Je)	1
Duncan (Du)	4
Indefatigable (I)	21
North Seymour (S)	2
Barrington (B)	5
Charles (Cs)	6
Chatham (Cm)	10
Hood (H)	4

Additional material, both pinned and in alcohol, was supplied by R. O. Schuster and D. Q. Cavagnaro of the Galapagos International Scientific Project, January to May 1964.

The method of collecting used in the field was chiefly beating of vegetation, with some sweeping. Litter was not examined.

METHODS

Specimens preserved in alcohol were dissected without prior treatment. Dry, pinned specimens, collected by workers other than I. W. B. T., were first soaked in a dilute solution of detergent until they were softened. The antenna, fore wing, hind wing and metathoracic leg of one side (usually the right side) were removed, dehydrated by passing through 95 % and absolute alcohol, cleared in Euparal Essence and mounted in Euparal on a clean slide.

To prepare the genitalia for dissection, the terminal half of the abdomen was excised, immersed in cold 10 % potassium hydroxide solution overnight, stained in a saturated solution of Lignin Pink for 2 or 3 minutes and dehydrated in 50 % and 100 % cellusolve. The abdominal apex was then transferred to a drop of Euparal on a slide.

With ♀ genitalia, the subgenital plate was freed first by cutting at its corners; the gonapophyses of the two sides were then separated from each other and from the spermapore plate. The rectal contents and the tissue between the paraprocts and the epiproct were cleared away and the dissected parts were transferred to a drop of Euparal on a clean slide and mounted with the external surfaces uppermost. With the ♂ genitalia, the hypandrium was first removed by cutting at its corners. The phallosome was then separated, and the epiproct and paraprocts treated in the same manner as for the ♀.

Diameter of the eye was measured by Badonnel's method (Ball, 1943). All other measurements were made from mounted slides under a microscope using an eye-piece micrometer, and are accurate to ± .003 mm. Drawings of genitalia were done by microprojection and reference photographs were made of the wings.

Almost all color descriptions were made after about two years of storage in alcohol.

The classification used follows that of Badonnel (1951) modified by Smithers (1967); names of new species are in **bold face**.

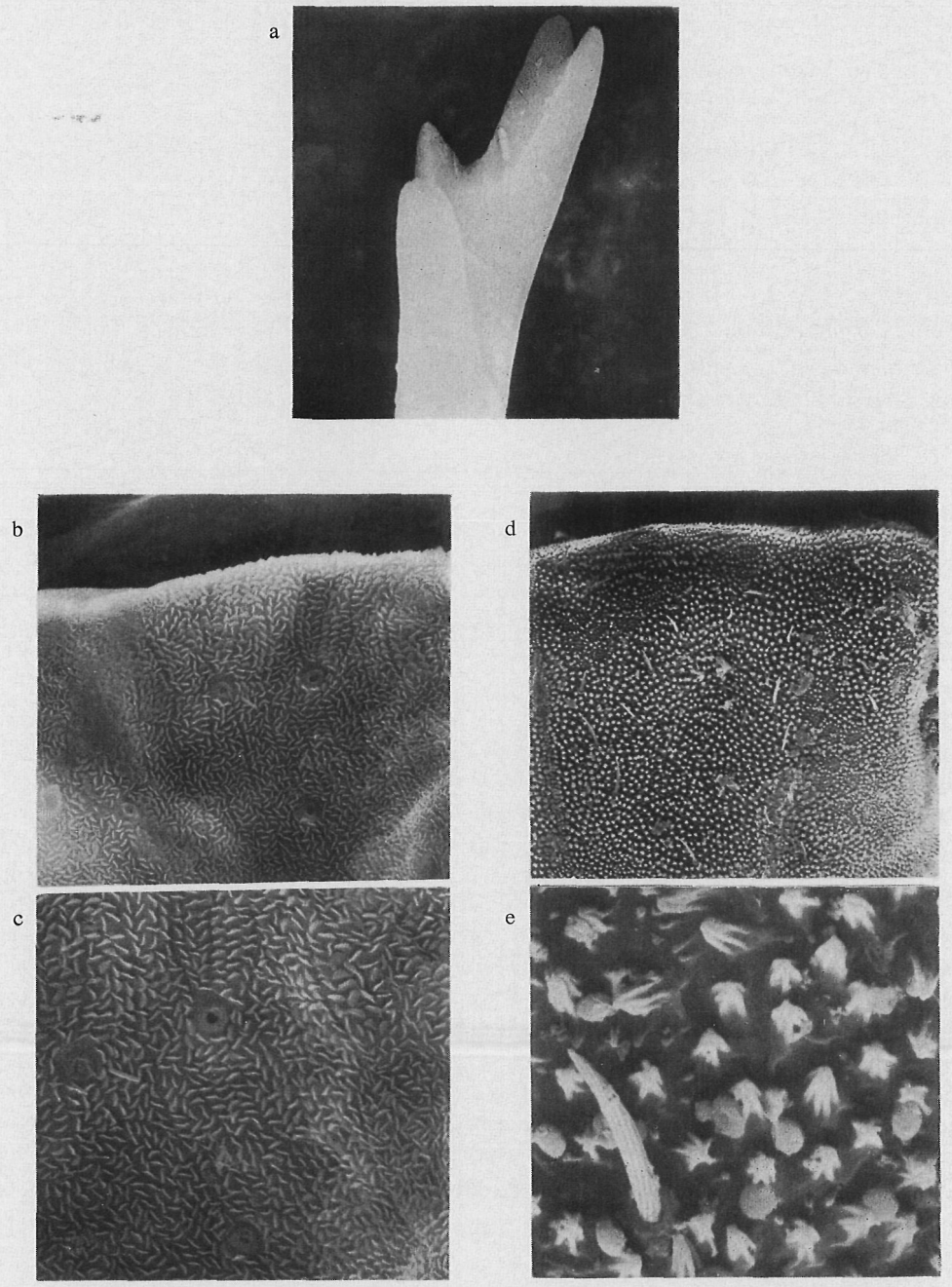


Plate. Scanning electron micrographs. a, apex of lacinia of *Tapinella francesca* n. sp. at 3000 ×; b, c, vertex sculpturing of *T. francesca* at 1000 × and 1500 ×; d, e, vertex sculpturing of *Pachytroctes achrosta* n. sp. at 375 × and 3000 ×.

CHECK-LIST OF SPECIES OF PSOCOPTERA KNOWN FROM THE GALAPAGOS ISLANDS

Family Lepidopsocidae

Echmepteryx (*Thylacopsis*) *lunulata* Thornton, Lee & Chui
Echmepteryx (*Thylacopsis*) *madagascariensis* Kolbe
Echmepteryx (**Loxopholia**) **aperta**
Lepidopsocus maculatus Thornton, Lee & Chui
Nepticulomima cavagnaroi
Soa reticulata

Family Trogiidae

Cerobasis treptica
Cerobasis lambda
Cerobasis recta

Family Psoquillidae

Psoquilla marginepunctata Hagen
Rhyopsocus orthatus

Family Liposcelidae

Embidopsocus pauliani Badonnel
Embidopsocus thorntoni Badonnel
Liposcelis entomophilus Enderlein

Family Pachytroctidae

Tapinella francesca
Tapinella stenomedia
Pachytroctes achrosta

Family Epipsocidae

Epipsocus campanulatus

Family Caeciliidae

Caecilius antillanus Banks
Caecilius distinctus Mockford
Caecilius insularum Mockford

Family Lachesillidae

Lachesilla aethiopica (Enderlein)
Lachesilla castroi

Family Ectopsocidae

Ectopsocus maindroni Badonnel
Ectopsocus meridionalis Ribaga
Ectopsocus richardsi Pearman (not found in present collection)
Ectopsocus sp.

Family Peripsocidae
Peripsocus pauliani Badonnel
Peripsocus stagnivagus Chapman
Peripsocus sp.
Peripsocus potosi Mockford

Family Pseudocaeciliidae
Pseudocaecilius criniger (Perkins)
Pseudocaecilius tahitiensis Karny

Family Archipsocidae
Archipsocus spinosus Thornton, Lee & Chui

Family Philotarsidae
Aaroniella galapagensis

Family Psocidae
Blaste uncinata
Ptycta acraea
Ptycta dentata
Ptycta marta

Family Myopsocidae
Myopsocus chelatus

SYSTEMATICS

FAMILY LEPIDOPSOCIDAE

Echmepteryx (Thylacopsis) lunulata Thornton, Lee & Chui

Echmepteryx (Thylacopsis) lunulata Thornton, Lee & Chui, 1972: 64.

Galapagos distribution: *ALBEMARLE: Sierra Negra, 200 m, "tilo" Mountain Ash; 180 m, *Citrus;* 180 m, *Psidium guajava*, *Achras sapota*, 9 km, NE Villamil, 60 m, lichen on *Zanthoxylum fagara;* 180 m, dead banana leaves; 180 m, *Solanum* sp. ("ciruella"); all on 29.IV. Shore, *Annona* sp., 30.IV. ABINGDON: 300–390 m, *Croton* and *Zanthoxylum fagara*, 6.VI; 360 m, 470 m, 500 m, *Pisonia floribunda*, 17.V; 18–300 m, 340 m, 390 m, *Zanthoxylum fagara*, 390 m, *Chiococca alba*, 360 m, *Croton scouleri* and *Scalesia*, all on 18.IV. JAMES: 390 m, *Persea grastissima*, 20.IV; 490 m, dead overhanging ferns, 20.IV. INDEFATIGABLE: Occidente, *Citrus* and tomato, 22.III; above Bella Vista, *Scalesia*, 23.III; above Bella Vista, *Scalesia*, *Persea gratissima*, "poma rosa", 24.III; Occidente, *Citrus* sp., 24.III; Academy Bay, *Maytenus obovata* and *Croton scouleri*, 24.III; Academy Bay, 28.I.1964, R. O. Schuster; Horneman Farm, 210 m, 7.V.1964 and Turtle Bay, I.1964, D. Q. Cavagnaro. CHARLES: Plateau, *Mangifera indica*, *Psidium guajava*, *Citrus* sp., 15.III; 340 m, *Mangifera indica*, 6.V. CHATHAM: 360 m, Progreso, *Psidium guajava* and others, 2.II.

Distribution elsewhere: Hawaii (Oahu, Maui), Micronesia (Bonin Is., N. Mariana Is., S. Mariana Is., Caroline Is., Marshall Is.).

* Unless otherwise noted, the collector is I. W. B. T. and the year is 1967.

Echmepteryx (Thylacopsis) madagascariensis (Kolbe)

Thylax madagascariensis Kolbe, 1885 : 184. — Enderlein, 1908 : 255.
Thylacopsis madagascariensis: Enderlein, 1911 : 348 ; 1931 : 229.
Echmepteryx costalis Banks, 1931 : 439. — Williams, 1931 : 371.
Lepidopsocus costalis: Zimmerman, 1948 : 224.
Thylacopsis albidus Badonnel, 1949a : 25.
Echmepteryx albidus : Badonnel, 1962 : 186.
Echmepteryx (Thylacopsis) madagascariensis : Thornton, Lee & Chui, 1972 : 66.

Galapagos distribution : ALBERMARLE : Sierra Negra, 180 m, *Psidum guajava, Achras sapota,* dead banana leaves, 29.IV ; shore, *Annona* sp., 30.IV. INDEFATIGABLE : Occidente, *Citrus* sp., 22–24.III ; above Bella Vista, "poma rosa" 24.III ; Horneman Farm, 210 m, 7. V.1964, D. Q. Cavagnaro. CHARLES : 340 m, *Solanum* sp. ("ciruella"), *Psidium guajava,* "poma rosa", *Persea gratissima, Mangifera indica,* 9.V. Evidently restricted to farming areas ; possibly an accidental introduction.

Distribution elsewhere : West Africa, Madagascar, Seychelles, Hong Kong, Micronesia (Bonin, N. Mariana, S. Mariana), Kermadecs, Hawaii, Chile, West Indies, possibly also eastern Central America, NE South America.

Echmepteryx (Loxopholia) aperta Thornton & Woo, new species Fig. 1–6.

♀. *Coloration :* Head generally pale cream with very distinct brown markings (Fig. 1). Epicranial suture pale. Ocelli pale with dark inner borders. Genae and clypeus pale. Labrum yellowish. Maxillary palps and antennae pale. Thorax pale with a brown band on episternum becoming darker anteriorly. Posterior sutures of dorsal lobes of mesothorax brown, forming a V-shaped mark pointing posteriorly. Anterior sutures of scutellum of metathorax brown forming a smaller, inverted V-shaped mark pointing anteriorly. Legs pale : hind femur with distal brown spot on the dorsal side ; tibia with 2 broad brown bands ; tarsus yellowish, proximal end of 1st tarsal segment slightly darker. Fore wing pale (Fig. 2) ; hind wing hyaline, veins brown except *sc*, r_1, and end of cu_2 (Fig. 3).

Morphology : Ocelli fairly wide-set. Maxillary palp with apical segment thickened at apex. Lacinia apex (Fig. 4) with four teeth. Venation of wings as in Fig. 2 and 3. Claw (Fig. 5) with serrations and preapical tooth. Paraproct simple, with 6 trichobothria. Epiproct setose, with a slight projection at posterior margin. Gonapophyses as in Fig. 6 (paratype).

*Dimensions**

♂. Unknown.

Holotype ♀, INDEFATIGABLE : Horneman Farm, 210 m, 7.V.1964, D. Q. Cavagnaro. Paratype ♀♀, ALBEMARLE : Sierra Negra, 970 m, crater rim, *Zanthoxylum fagara,* 28.IV. JAMES : 390 m, *Persea gratissima,* 20.IV. Other specimens : ALBEMARLE : Sierra Negra, 200 m, "tilo" Mountain Ash, 29.IV. JAMES : 490 m, dead overhanging ferns at water, 20. IV. INDEFATIGABLE : E. slope, 150 m, on lichen on trees, 16.IV.1964, D. Q. Cavagnaro. CHARLES : Plateau, *Psidium guajava, Citrus* sp., 15.III. CHATHAM : base of Cerro Brujo, *Scalesia divisa,* 28.III. Holotype CAS.

* Dimensions are reported in respective table for many of the species described as new. In subsequent descriptions or tables the abbreviations in parentheses will be used for these characters, as in Table 1.

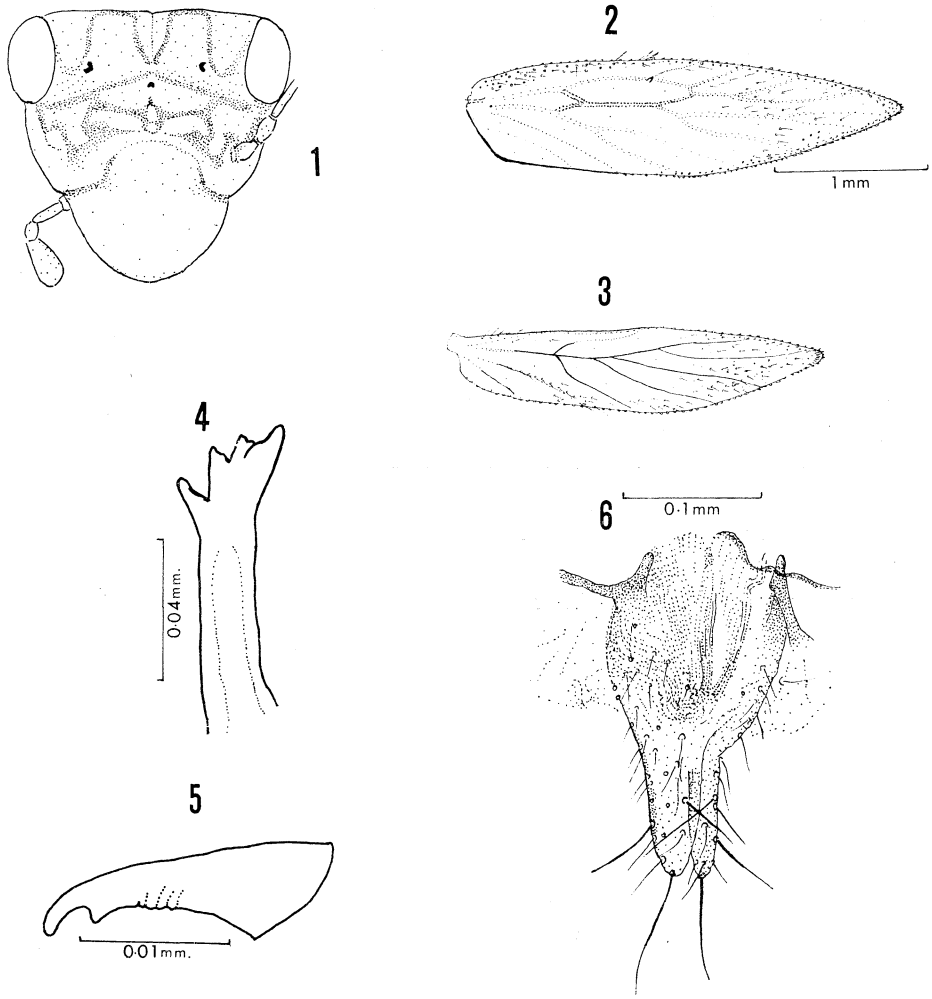


Fig. 1-6. *Echmepteryx* (*Loxopyolia*) *aperta* n. sp. ♀ : 1,. head ; 2, fore wing ; 3, hind wing ; 4, lacinia apex ; 5, claw ; 6, gonapophyses. Figures 2 and 3 to common scale.

This species closely resembles *E. lealae* found in birds' nests in Brazil (New, 1972), but differs from it in that the U-shaped vertex markings are open, and the stripes on the head are narrower.

Lepidopsocus maculatus Thornton, Lee & Chui

Lepidopsocus maculatus Thornton, Lee & Chui, 1972 : 68.

Galapagos distribution : NARBOROUGH : Punta Espinosa, *Rhizophora mangle, Avicennia officinalis, Laguncularia racemosa,* 27.III. ALBEMARLE : Volcan Wolf, 420 m, *Tournefortia rufosericea,* 360 m, *Scalesia,* 20.V ; Black Cove, *Laguncularia racemosa, Rhizophora mangle,*

Table 1. Metric and meristic characters of *Echmepteryx aperta* n. sp. (individual specimens represented by numbers)

	1	2	3
Length (in mm) of basal flagellar segment (f_1)	0. 024	—	0. 024
Length (in mm) of second flagellar segment (f_2)	0. 024	—	0. 024
Ratio of basal flagellar segment to second flagellar segment (f_1 : f_2)	1. 000	—	1. 000
Ratio of interocular distance to eye diameter (I. O. : D)	0. 375	0. 400	0. 400
Length (in mm) of fore wing (Fw)	1. 761	—	1. 761
〃 〃 〃 hind wing (Hw)	1. 452	1. 476	1. 476
〃 〃 〃 hind femur (Hf)	0. 476	0. 476	0. 500
〃 〃 〃 hind tibia (Ht)	0. 785	0. 785	0. 833
〃 〃 〃 basal hind tarsal segment (t_1)	0. 262	0. 262	0. 286
Length (in mm) of second hind tarsal segment (t_2)	0. 048	0. 048	0. 048
Ratio of basal hind tarsal segment to second hind tarsal segment (t_1 : t_2)	5. 500	5. 500	6. 000
Number of ctenidiobothria on basal hind tarsal segment (Ct)	15	14	14
Number of trichobothria on paraproct	6	6	—

Note: In subsequent tables the abbreviations in parenthesis will be used for these characters.

27.III; Sierra Negra, 9 km NE of Villamil, 60 m, *Zanthoxylum fagara* and lichen, 29.IV; shore Villamil, *Avicennia nitida*, 30.IV. JAMES: 255 m, *Psychotria rufipes*, 19.IV; James Bay, *Acacia* sp., 390 m, *Persea gratissima*, 20.IV. DUNCAN: shore, *Rhizophora mangle*, *Maytenus obovata*, 21.IV. INDEFATIGABLE: Academy Bay, 15-30 m, *Acacia* with lichen, 2.III; Academy Bay, *Maytenus obovata*, *Croton scouleri*, 7.III; Academy Bay, 25.I. 1964, 12.II.1964, Horneman Farm, 210 m, 7.V.1964, D. Q. Cavagnaro; above Bella Vista, *Scalesia*, *Citrus* sp., "poma rosa", 23-24.III. CHARLES: plateau, *Mangifera indica*, *Psidium guajava*, *Ctirus* sp., 15.III; 340 m, *Macraea laricifolia* and *Scalesia pedunculata*, 6.V; Black Beach, *Prosopis* sp., 7.V. TOWER: 15 m, crater lake, 45 m, crater edge, 3.III. CHATHAM: 360 m, Progreso, *Psidium guajava* and others, 28.II; near shore, *Scutia spicata*, *Croton scouleri*, 13.IV; Sappho Cove, *Maytenus obovata*, dead twigs of *Scutia spicata*, 27.V; base of Cerro Brujo, *Scalesia divisa*, 28.V.

Distribution elsewhere: Hawaii, Micronesia (S. Mariana Is.).

Nepticulomima cavagnaroi Thornton & Woo, new species Fig. 7-11.

♀. *Coloration:* Head generally yellowish and heavily speckled with small brown spots ex-

cept on lower half of clypeus and labrum. Epicranial suture dark brown. Faint, curved W-shaped mark made up of a chain of rings in middle of frons. Ocelli pale, with dark brown inner borders. Suture between vertex and frons hardly visible. Maxillary palp light brown, apical segment slightly darker. Antenna light brown. Thorax with terga and sterna pale, terga of mesothorax slightly darker than rest. Sutures brown. Legs: coxa and femur pale, with light brown spots; tibia and tarsus yellowish. Fore wing (Fig. 7) light brown, veins dark brown, except vein *an*, *ax*, proximal 1/2 of *r* and distal 1/2 of cu_2 hyaline. Hind wing (Fig. 8) hyaline, veins dark brown. Abdomen pale cream.

Morphology: Head covered with fine hairs, longer hairs near gena. Maxillary palp with apical segment thick, tapering to a blunt end. Lacinia (Fig. 9) with 3 teeth close to apex and 1 subapical diverging tooth. Fore wing fairly wide, pointed at distal end, venation as in Fig. 7. Venation of hind wing as in Fig. 8. Claw (Fig. 10) with preapical tooth. Gonapophyses as in Fig. 11.

Dimensions: f_1=0.119 mm. f_2=0.119 mm. I. O. :D=0.529 mm. Fw=2.142 mm. Hw=1.761 mm. Hf=0.595 mm. Ht=1.000 mm.

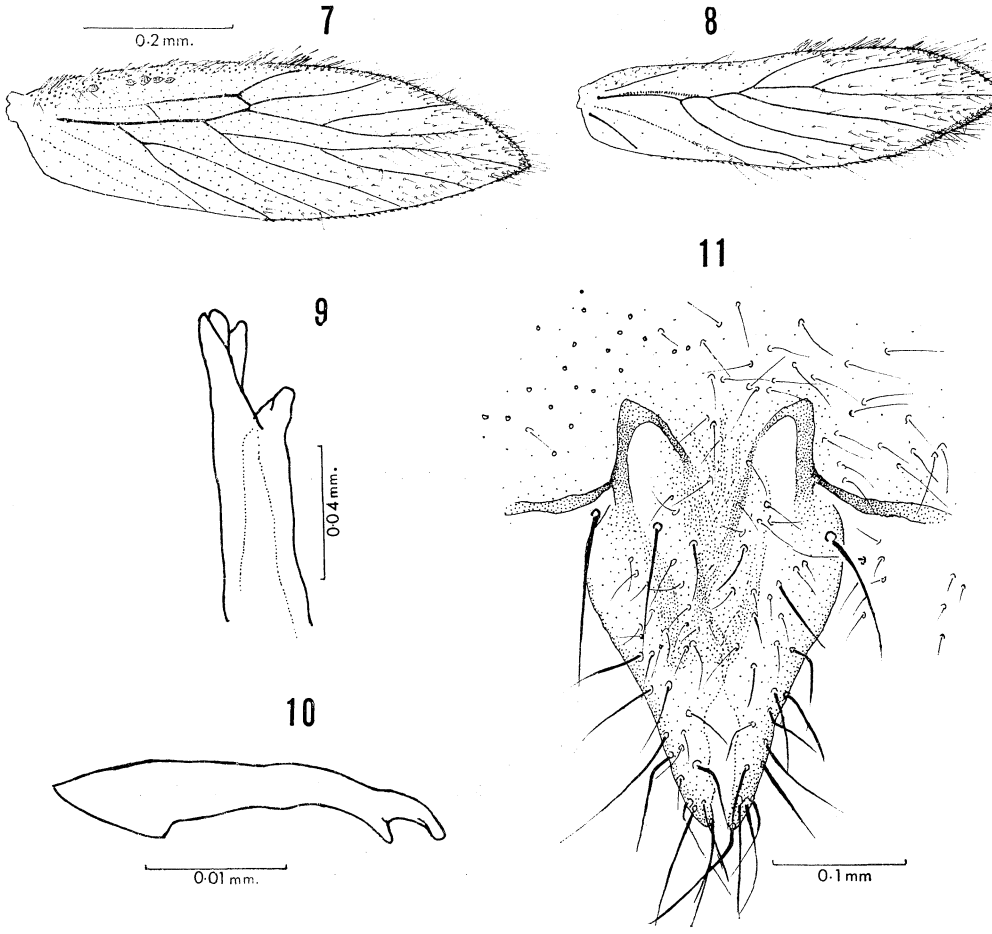


Fig. 7-11. *Nepticulomima cavagnaroi* n. sp ♀ : 7, fore wing; 8, hind wing; 9, apex of lacinia; 10, claw; 11, gonapophyses. Figures 7 and 8 to common scale.

♂. Unknown.

Holotype ♀, INDEFATIGABLE: Horneman Farm, 7.V.1964, D. Q. Cavagnaro, CAS.

This species differs from all other *Nepticulomima* species in fore and hind wing venation.

Soa reticulata Thornton & Woo, new species Fig. 12–16.

♀. *Coloration:* Head generally brown without distinct markings. Epicranial suture dark brown with faint V-shaped mark made up of brown dots. Ocelli pale, posterior two with thick dark inner borders, anterior ocellus surrounded by a narrow dark edge. Frons and clypeus with indistinct net-like marks. Gena dark brown. Maxillary palps lost. Antenna light brown. Thorax with terga pale cream, sterna yellowish, episternum brown. Legs brown, femur and proximal 2/3 of tibia darker. Fore wing (Fig. 12) brown with a narrow pale area along vein *an*. Hind wing hyaline, all veins distinct. Abdomen pale with brown scales.

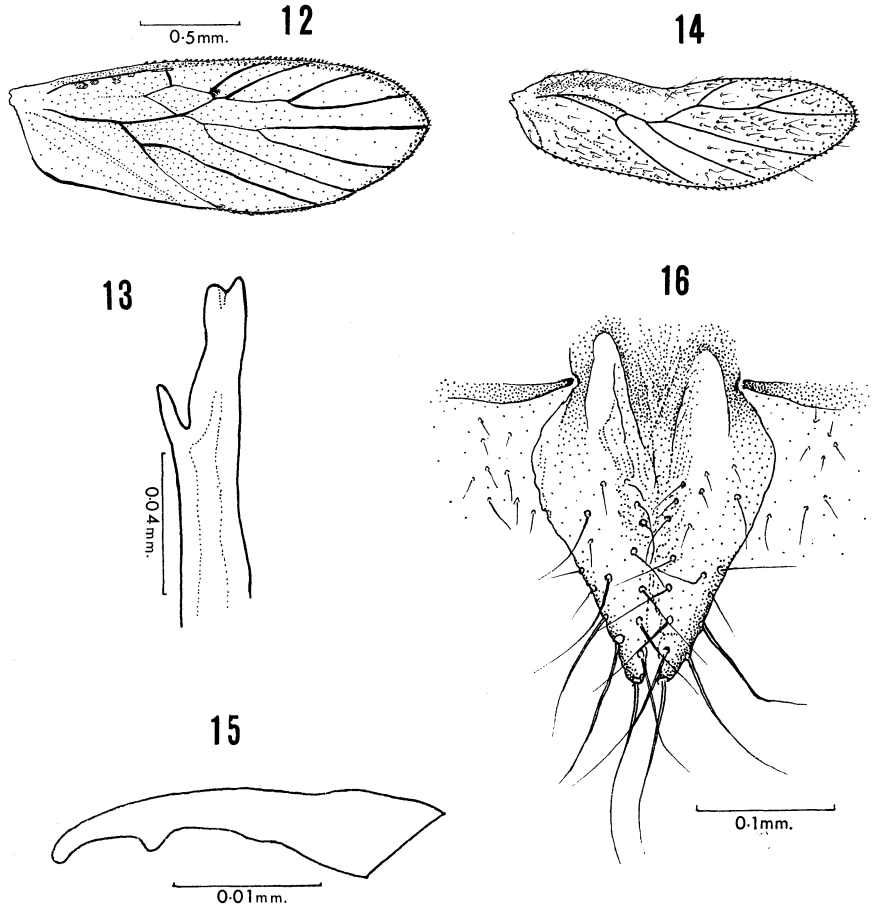


Fig. 12–16 *Soa reticulata* n. sp. ♀: 12, fore wing; 13, apex of lacinia; 14, hind wing; 15, claw; 16, gonapophyses. Figures 12 and 14 to common scale.

Morphology: Eyes moderately large. Ocelli close together, anterior ocellus smaller. Lacinia (Fig. 13) with a double tooth apically and another diverging tooth some distance from apex. Fore wing rounded, venation as in Fig. 12. Hind wing (Fig. 14) with curved anterior margin. Claw (Fig. 15) narrow, with distinct preapical tooth. Epiproct setose, rounded at base. Paraproct with 6 trichobothria. Gonapophyses as in Fig. 16.

Dimensions: I. O.: D=0.588 Fw=2.071 mm. Hw=1.690 mm. Hf=0.595 mm. Ht=0.928 mm. t_1=0.381 mm.

♂. Unknown.

Holotype ♀, INDEFATIGABLE: Horneman Farm, 7.V.1964, D. Q. Cavagnaro, CAS.

This species resembles *Soa flaviterminata*, found in Africa, Asia and South America, in the subcosta of the fore wing and the shape of the hind wing, but differs from it in many other features.

FAMILY TROGIIDAE

Cerobasis treptica Thornton & Woo, new species Fig. 17–25.

♀. *Coloration:* Head generally pale cream with brown markings. Epicranial suture and frons-vertex suture dark brown. Head pattern as in Fig. 17. Gena cream with L-shaped mark between orbit and antennal socket. Eyes black. Maxillary palp pale except brown band on proximal 1/2 of 3rd and 4th segments from base. Antenna with scape and pedicel brown, first flagellar segment pale with a brown band near apex, width of band increasing on subsequent 7 segments; 8th or 9th and subsequent segments completely brown. Thorax with terga pale except lateral edges spotted brown. Episternum brown, sterna pale cream. Legs: coxa and trochanter pale cream; hind femur variable: completely brown, with a brown band at distal end, with 2 subdistal spots; tibia with 2 brown bands of variable width, with 1 subdistal spot; 1st tarsal segment light brown gradually becoming pale, 2nd and 3rd tarsal segments light brown. Abdomen with a distinct cross-shaped brown mark in the adult, cross sometimes with more than 1 transverse arm, a longitudinal band present on either side of abdomen joining transverse arm of cross.

Morphology: Head covered with short hairs. Eyes moderately large. Ocelli absent. Antenna with 25–27 short segments. Each segment covered with 6–7 long hairs. Lacinia with trifid tip, all teeth pointed (Fig. 18). Completely apterous. Hind tibia with 2 apical spurs, 12–15 preapical spines on outer edge. First tarsal segment with 2 apical spurs. Epiproct setose, pointed, with 2 strong setae on margin. Paraproct with a strong posterior spine, without trichobothria. Gonapophyses with dorsal valve elongate, setose strongly sclerotized on inner edge, remnant of ventral valve present as a thin structure (Fig. 19). Spermapore unsclerotized.

♂. *Coloration:* As ♀.

Morphology: Usually smaller than ♀. Hypandrium (Fig. 20) simple, abdominal brush present as about 80–90 strong hairs densely aggregated. Phallosome (Fig. 21) symmetrical, with 2 thin parameres, stouter at free ends and joined posteriorly by a transparent setose transverse band around which is a complex sclerotization. Epiproct and paraprocts similar to those of ♀.

Holotype ♀, INDEFATIGABLE: 15–30 m, *Acacia* with lichen, 2.III. Allotype ♂, BARRINGTON: 60 m, *Bursera malacophylla*, *Tournefortia*, 12.III. Paratypes same data as holotype and allotype. Other specimens (Fig. 22): CULPEPPER; N. Cliff, 60 m, *Croton*, 11.VI. WENMAN: W. Cliff, 230 m, *Scalesia* and *Croton*, 9.VI; NW, 55 m, Booby plateau, *Croton*, 10.VI. NARBOROUGH: Punta Espinosa, *Avicennia nitida*, 27.III. ALBEMARLE:

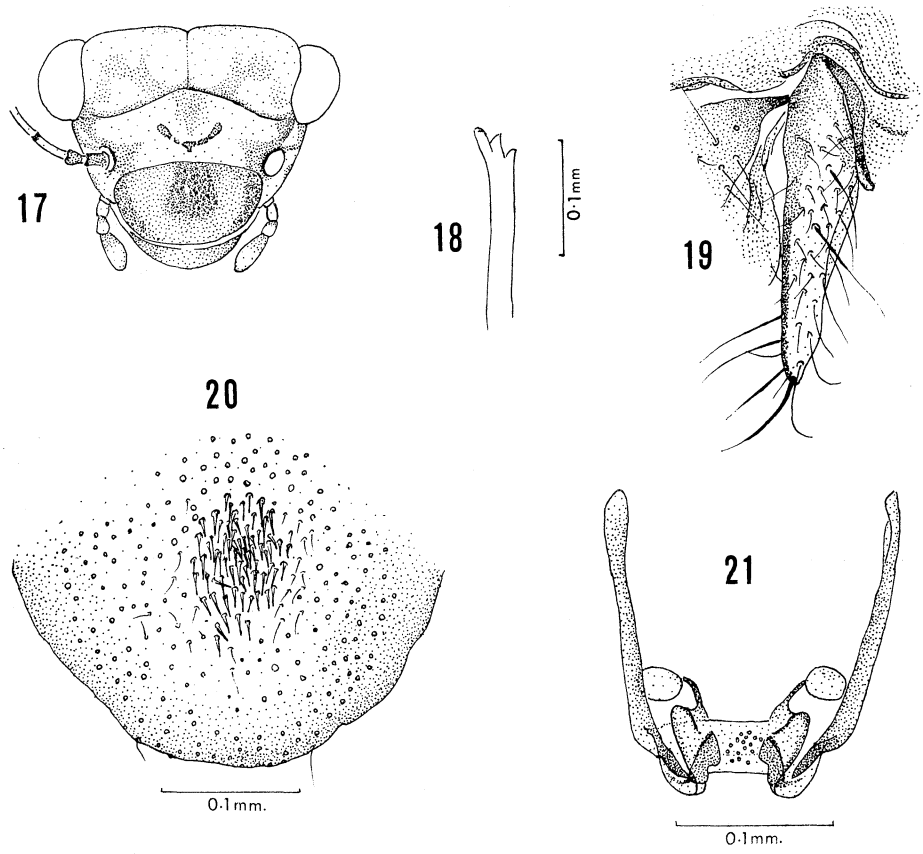


Fig. 17-21. *Cerobasis treptica* n. sp. ♀ : 17, head; 18, lacinia; 19, gonapophyses. ♂ : 20, hypandrium; 21, phallosome. Figures 19 and 20 to common scale.

Volcan Wolf, 420 m, *Tournefortia rufosericea*, 1360 m, *Zanthoxylum fagara*, 20.V; Volcan Darwin, W. slope, 500-800 m, *Dodonaea viscosa*, 29.III; Tagus Cove, *Castela galapagea* with encrusting lichen, *Cordia lutea* dead stump with lichen, *Croton scouleri*, 29.III; Black Cove, *Laguncularia racemosa*, 27.III; Volcan Alcedo, 610 m, "paga paga", 460 m *Zanthoxylum fagara* and lichen, 1.V; Sierra Negra, 60 m, 9 km NE Villamil, *Zanthoxylum fagara* and lichen, Villamil shore, *Avicennia nitida*, 29-30.IV; Punta Albemarle, *Laguncularia racemosa*, 19.V. BRATTLE, 55-90 m, *Periloba galapagensis*, *Croton scouleri*, 31.III. ABINGDON: 500 m, *Pisonia floribunda*, 17.V; 180-390 m, *Zanthoxylum fagara*, *Chiococca alba*, *Scalesia*, 18.V; 300-390 m. *Croton* and *Zanthoxylum fagara*, 8.VI. JAMES: 490 m, water, *Croton scouleri*, 580 m, dead tree, James Bay, *Acacia* sp., 610 m, *Pisonia floribunda*, 390 m, *Persea gratissima*, 170 m, lava desert, *Hippomane mancinella*, 580 m, *Croton*, 20.IV; 580 m, *Pisonia floribunda*, 610 m, *Psychotria rufipes*, 640 m, *Pisonia floribunda* and *Zanthoxylum fagara*, 580 m, dead tree with lichen, 19.IV; Sullivan Bay, *Maytenus obovata*, *Cryptocarpus pyriformis*, 15.V; Buccaneer Bay, *Castela galapagea*, 12.VI. JERVIS: lagoon, dead twigs and *Maytenus obovata*, 21.IV. DUNCAN: 390-460 m, *Croton scouleri*, 120 m, *Prosopis juliflora*,

Table 2. Metric and meristic characters of *Cerobasis treptica* n. sp. (lengths in mm; individual specimens represented by numbers)

Female	1	2	3	4	5
I. O. : D	0. 357	0. 400	0. 375	0. 375	0. 375
Hf	0. 374	0. 406	0. 406	0. 406	0. 390
Ht	0. 530	0. 608	0. 608	0. 577	0. 593
t_1	0. 218	0. 234	0. 218	0. 234	0. 218
t_2	0. 047	0. 047	0. 047	0. 047	0. 047
t_1 : t_2	4. 667	5. 000	4. 667	5. 000	4. 667
Male	1	2	3	4	5
I. O. : D	0. 333	0. 385	0. 385	0. 385	0. 357
Hf	0. 390	0. 390	0. 374	0. 359	0. 359
Ht	0. 562	0. 562	0. 515	0. 499	0. 484
t_1	0. 218	0. 218	0. 203	0. 203	0. 203
t_2	0. 047	0. 047	0. 047	0. 047	0. 047
t_1 : t_2	4. 667	4. 667	4. 333	4. 333	4. 333

Maytenus obovata, *Rhizophora mangle*, 18,21.IV; SW, tortoise plateau, 300 m, *Scalesia* and *Zanthoxylum fagara*, 13.VI; upper and summit caldera areas, 7.II.1964, D. Q. Cavagnaro. BINDLOE : 45 m, *Croton*, 16.V. NORTH SEYMOUR : 25 m, *Maytenus obovata*, *Bursera malacophylla*, 3.III, 7.IV. CHARLES: Black Beach, *Prosopis* sp., *Clerodendron molle*, 5.V; 340 m, *Solanum* sp. ("ciruella"), *Psidium guajava*, "poma rosa", *Scalesia pedunculata*, 6-7.V. TOWER: 15 m, Crater Lake, mangrove, 45 m, crater edge, *Bursera malacophylla* and *Cordia lutea*, 15 m, shore, *Croton*, 8.III. CHATHAM: 360 m, Progreso, *Psidium guajava*, 28.II; base of Cerro Pitt, *Scutea spicata*, *Scalesia incisa*, *Cordia lutea*, *Encelia hispida*, 26.V; Sappho Cove, *Maytenus obovata*, dead twigs, *Scutea spicata*, *Hippomane mancinella*, 27.V; base of Cerro Brujo, *Maytenus obovata*, *Cryptocarpus* and *Roccella*, *Castela galapagea*, dead *Cordia*, *Scalesia divisa*, *Encelia hispida*, 28.V; 520 m, El Junco, *Psidium guajava*, 10.IV; 1 km S of El Junco, *Psidium guajava*, 460 m, E. of El Junco, *Miconia* with moss and lichen, 11.IV; near shore, *Scutia spicata*, *Croton scouleri*, *Cassia picta*, 13.IV. HOOD: SW., 110-150 m, *Acacia*, *Cordia lutea*, 14.III; pools, *Cordia lutea*, *Acacia*, 13.III; Gardner-By-Hood: *Bursera malacophylla*, *Acacia*, *Cordia lutea*, *Croton*, 13. III. Holotype BISHOP 9910.

This species is widespread, occurring mainly in the lowlands. It shows great variability, particularly in pigmentation. Generally, 3 main forms can be recognized (Fig. 22):

1. A pale form found on Wenman. Albemarle (Volcan Darwin), Duncan, and Hood with body and head very light in color, hind femur variable in pattern with 1 or 2 subdistal spots, tibial bands very narrow (Fig. 23).
2. A striped form with distinct head pattern found on all islands. This form has the hind femur with a brown distal band and sometimes an additional subdistal spot, and the tibial bands moderately thick (Fig. 24).

   Approximately 20 % of specimens would be very difficult to assign to one or other of the above two forms.

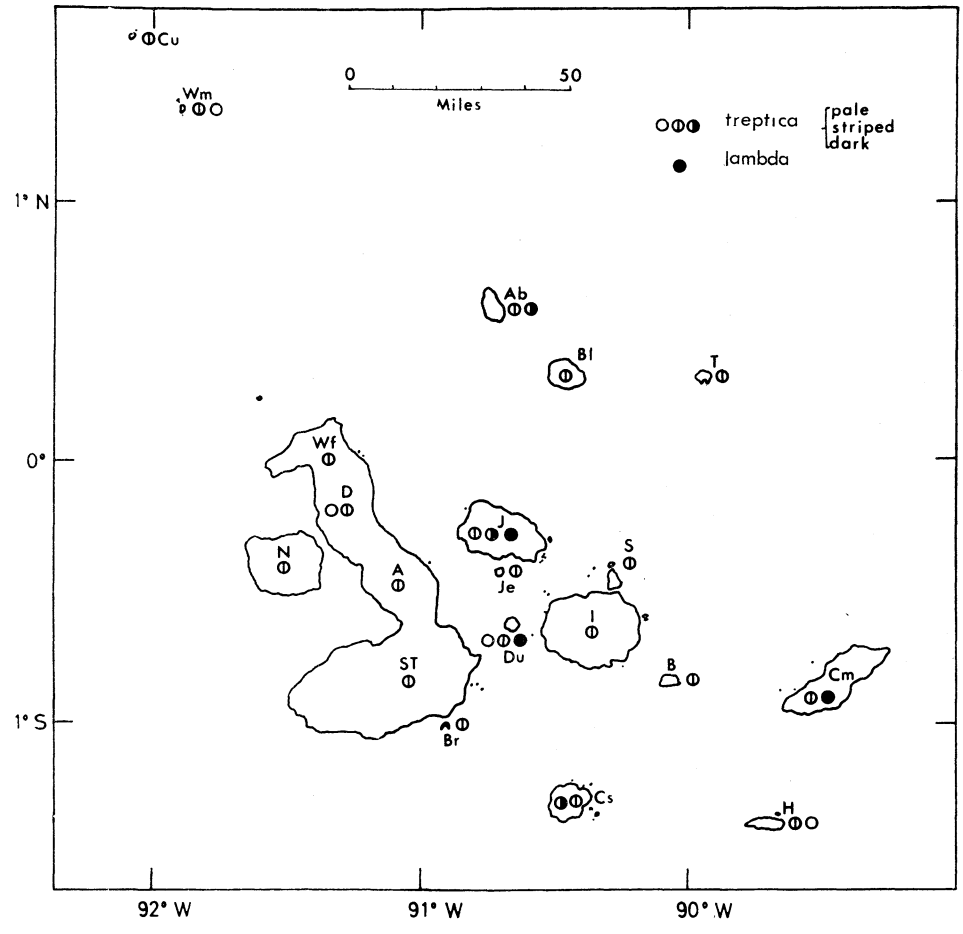


Fig. 22. Distribution of *Cerobasis treptica* and *Cerobasis lambda* in the Galapagos Islands. For abbreviations see pages 2 and 3.

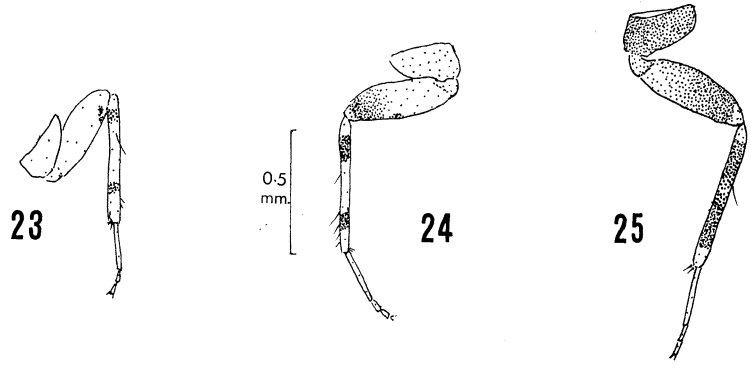


Fig. 23-25. *Cerobasis treptica* n. sp. ♀, hind legs: 23, pale form; 24, striped form; 25, dark form. Common scale.

3. A dark form found on Abingdon, James and Charles, with brown coxa and trochanter, with the hind femur brown except at both ends, the tibial bands almost united to form a continuous band (Fig. 25), and the head pattern slightly blurred.

Approximately 5% of specimens would fall between forms 2 and 3 above.

Forms 1 and 2 occur together on Wenman, Volcan Darwin, Duncan and Hood; forms 2 and 3 occur together on Abingdon, James and Charles; forms 1 and 3 have not been collected together (Fig. 22). Because of the presence of intergrading specimens between these forms, no formal taxonomic status is given to any of them.

Cerobasis lambda Thornton & Woo, new species Fig. 22, 26, 27.

♀. *Coloration:* Head generally yellowish. Epicranial suture and frons-vertex suture dark. Head pattern resembling that of *Cerobasis treptica,* but blurred. Gena pale cream. Clypeus and labrum brown. Maxillary palp with 1st and 2nd segment from base cream, 2 apical segments brown, slightly paler at apex of apical segment. Antenna brown except pale at joints. Thorax with terga light brown, sterna yellowish, episternum brown. Legs; coxa and trochanter light brown or brown; femur brown; tibia brown except pale at ends; tarsus light brown (Fig. 26). Abdomen with yellowish to light brown cross-shaped mark dorsally and 2 lateral longitudinal bands.

Morphology: Ocelli absent. Lacinia apex trifid, middle tooth blunt (Fig. 27). Completely apterous. Tibia with two apical spurs and 2 preapical spurs on inner edge a short distance from distal end and 9-13 spines on outer edge. Genitalia identical with those of *Cerobasis treptica.*

♂. *Coloration:* As ♀.

Morphology: Usually smaller than ♀. Hypandrium and phallosome as in *Cerobasis treptica.*

Galapagos distribution: Holotype ♀, CHATHAM: 360 m, Progreso, *Psidium guajava,* 28.

Table 3. Metric and meristic characters of *Cerobasis lambda* n. sp. (lengths in mm; individual specimens represented by numbers)

Female	1	2
I. O.: D	0.333	0.400
Hf	0.468	0.452
Ht	0.655	0.593
t_1	0.250	0.234
t_2	0.062	0.055
t_1 : t_2	4.000	4.286
Male	1	2
I. O.: D	0.400	0.333
Hf	0.452	0.390
Ht	0.640	0.515
t_1	0.265	0.218
t_2	0.055	0.047
t_1 : t_2	4.857	4.667

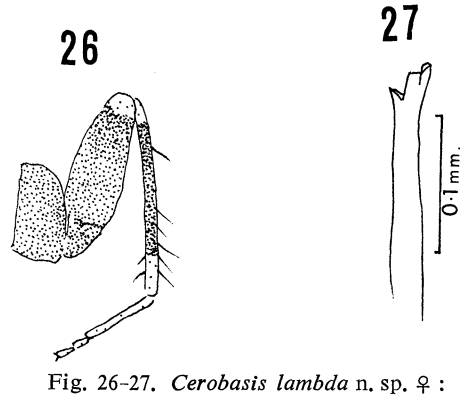


Fig. 26-27. *Cerobasis lambda* n. sp. ♀: 26, hind leg; 27, lacinia apex. Leg to same scale as fig. 23-25.

II. Allotype ♂, same data as holotype. Paratypes, CHATHAM: 520 m, El Junco, *Psidium guajava*, 460 m, E of El Junco, *Miconia* with moss and lichen, 11.IV; near shore, *Scutia spicata*, *Croton scouleri*, *Cassia picta*, 13.IV. JAMES: 580 m, dead tree, 410 m, *Pisonia floribunda*, 20.IV; 580 m, *Pisonia floribunda*, 610 m, *Psychotria rufipes*, 640 m, *Pisonia floribunda* and *Zanthoxylum fagara*, 19.IV; lava desert, *Hippomane mancinella*, 580 m, dead *Croton*, 20.IV. DUNCAN: 390–460 m, *Croton scouleri*, 18.IV; upper and summit caldera, 7.II.1964, D. Q. Cavagnaro. Holotype BISHOP 9911.

This species is extremely similar to *Cerobasis treptica*, especially to the dark form of that species, but differs from it in the characters listed in Table 4. Because of the constancy of the differences in preapical tibial spurs, tibial pigment, lacinia and L-shaped genal mark, we have decided to describe *Cerobasis treptica* and *Cerobasis lambda* as separate species. The two overlap in range (Fig. 22) and in many cases they were found on the same tree. The two species could be the result of a double invasion of the archipelago from a single continental parent population, or they could have arisen after a single colonizing event, with subsequent speciation on the archipelago. *C. treptica* is highly variable and is widespread on the Galapagos, occurring on all islands. *C. lambda* is more restricted in its distribution, being known so far only from James, Duncan and Chatham, and is much less variable. On the basis of range, *treptica* might be regarded as the older with *lambda* a later offshoot. The presence today of intergrading but identifiable forms of *treptica* might suggest how *lambda* could have arisen in the past by the geographical isolation of such a form. However, the disjunct distribution of *lambda* is difficult to reconcile with this view. Possibly this disjunct distribution is the result of contraction of a once wider range, perhaps involving competition with a younger, more successful and expanding *treptica*. The present variability in *treptica* also suggests that it has not yet reached its adaptive peak on the archipelago, and may thus be the younger.

Badonnel (1962) recorded *Cerobasis guestfalica* Kolbe from Argentina, and described *Cerobasis chrysops* (Badonnel, 1963) and *Cerobasis maculiceps* (Badonnel, 1967b) from Chile. Both species described above are clearly distinguishable from the three species recorded from South America, on the head and abdominal color pattern, which is more similar to the pattern in *C. guestfalica* than to those in the other two species.

Cerobasis recta Thornton & Woo, new species Fig. 28, 29.

♀. *Coloration:* Head generally pale cream, vertex with 2 rectangular patches of brown spots. Frons with a similar median patch, in the center of which is a pale area; on either side, a brown band stretches from between the eye and antennal socket to the clypeus. Remainder of clypeus pale cream (Fig. 28). Gena slightly darker than ground color. Maxillary palp pale cream with apical 2 segments light brown. Labrum same color as gena. Antenna pale with scape and pedicel mottled with brown spots. Thorax with terga and sterna pale cream, sutures marked with thin lines of brown spots. Legs pale. Abdomen pale cream, 9th tergum brown.

Morphology: Ocelli absent. Distal segment of maxillary palp broad. Antenna with more than 28 segments, pubescent. Lacinia apex trifid. Completely apterous. Coxal rasp present. Tibia with 2 long apical spurs and 1 short one, 2 preapical spurs on inner edge and 9 preapical spines on outer edge. Genitalia with gonapophyses broad, sclerotized on outer edge (Fig. 29). Ventral valve very reduced. Spermapore sclerotized, without obvious accessory glands. Paraproct simple, setose, without trichobothria. Epiproct simple.

Dimensions: I. O.: D=0.500 Hf=0.452 mm. Ht=0.671 mm. t_1=0.250 mm.
♂. Unknown.

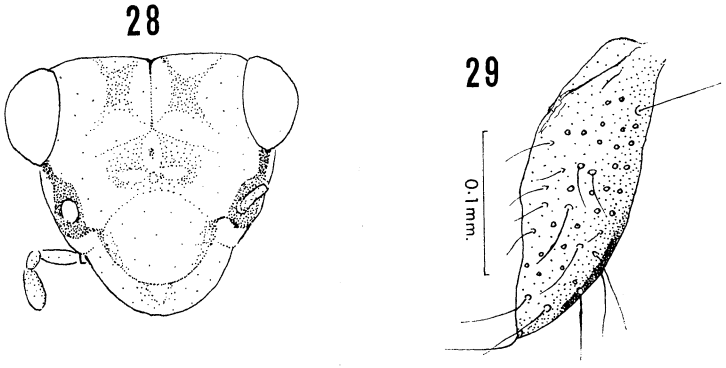


Fig. 28-29. *Cerobasis recta* n. sp. ♀ : 28, head; 29, gonapophyses.

Table 4. A comparison of characters of two new species of *Cerobasis*

Characters	*Cerobasis treptica*	*Cerobasis lambda*
1. Femur pattern	Varying from pale cream to almost completely brown with the following stages: wholly pale cream; 1 brown subdistal spot; 2 brown subdistal spots; 1 brown distal band; 1 brown band and 1 subdistal spot; distal half of femur brown; brown except at both ends.	Brown except at both ends.
2. Trochanter color	Pale to brown.	Brown.
3. Tibial pigment	Two brown bands variable in thickness.	One continuous brown band occupying nearly the whole of tibia except at both ends.
4. L-shaped genal mark	Present.	Absent.
5. Marks on frons and vertex	Distinct in most specimens.	Indistinct.
6. Coloration of antenna	Brown ring on f_1, becoming thicker on next 7 segments, 8th or 9th and subsequent segments completely brown.	All flagellar segments brown.
7. No. of preapical tibial spurs	0	2
8. Coloration of maxillary palps	Brown band at proximal end of 3rd and 4th segment.	Apical two segments completely brown.
9. Lacinia	Sharp middle tooth.	Blunt middle tooth.

Holotype ♀, JAMES: 490 m, dead overhanging ferns near water, 20.IV. Paratype ♀, same data. Holotype BISHOP 9912.

This species is entirely distinct from either *Cerobasis treptica* or *Cerobasis lambda*, and can easily be identified on head pattern. *C. recta* is the only one of the three species to have a sclerotized spermapore. It is also clearly distinguishable on color pattern from the three species already recorded from South America.

FAMILY PSOQUILLIDAE

Psoquilla marginepunctata Hagen

Psoquilla marginepunctata Hagen, 1865: 123. — Williams, 1932: 8. — Zimmerman, 1948: 226.
Heteropsocus dispar Verrill, 1902: 817.

Galapagos distribution: INDEFATIGADLE: Horneman Farm, 210 m, 17.V.1964, D. Q. Cavagnaro.

Distribution elsewhere: England, Congo, Gold Coast, Ivory Coast, Angola, Malaya, Taiwan, Hawaii, Paraguay, Brazil, N. America. Bermuda.

A cosmopolitan species associated with man and his stored products.

Rhyopsocus orthatus Thornton & Woo, new species Fig. 30-35.

♀. *Coloration* (after *c.* 8 years in alcohol): Head generally dark brown, clypeus a little paler; median epicranial suture, margins of antennal sockets and of clypeus finely lined very dark brown. Antennae pale brown, basal 3 flagellar segments edged with dark brown at apices. Palps pale brown, apical segment a little darker. Eyes black, ocelli clear, centripetally bordered black. Thorax dark brown, antedorsum II pale, scutellum II very dark brown, sutures dark. No thoracic pleural stripes. Legs pale brown, tibiae and tarsi somewhat darker. Wings hyaline. Abdomen cream, terminal sclerites brown, no lateral abdominal pigment.

Morphology: Lacinia bidentate (Fig. 32, paratype). Wing venation as in Figs. 30 and 31 (hind wing, paratype), anal lobe of fore wing well marked off by marginal notch, somewhat angular. Claw without preapical tooth. Gonapophyses as in Fig. 33. Epiproct triangular, with 2 rows of setae (Fig. 34), paraproct with 4-6 trichobothria, usually 5, in staggered rows of 3 and 2.

Dimensions: Body length=1.600 mm. I. O.: D=2.200 Fw=1.445 mm. Hw=1.205 mm. Fore wings not reaching ninth abdominal tergite. Hf=0.453 mm. Ht=0.595 mm. t_1=0.210 mm. t_2=0.050 mm. t_3=0.050 mm. $t_1 : t_2 : t_3$=4.20 : 1 : 1 f_1=0.087 mm. f_2=0.055 mm. $f_1 : f_2$=1.520

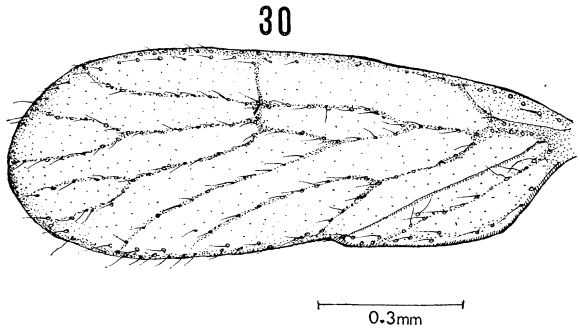
♂. *Coloration* (after *c.* 8 years in alcohol); As ♀.

Morphology: As ♀. 9th tergite without posterior paired prongs or lobes. Hypandrium and phallosome as in Fig. 35. Epiproct as in ♀, paraproct with 5 trichobothria.

Dimensions: Body length=1.400 mm. I. O.: D=2.200 Fw=1.445 mm. Hw=1.270 mm. Fore wings do not reach 9th abdominal tergite. Hf=0.478 mm. Ht=0.523 mm. t_1=0.210 mm. t_2=0.050 mm. t_3=0.045 mm. $t_1 : t_2 : t_3$=4.20 : 1 : 1.04 f_1=0.047 mm. f_2=0.040 mm. $f_1 : f_2$=1.180

Holotype ♀, INDEFATIGABLE: Horneman Farm, 220 m, 7.V.1964, D. Q. Cavagnaro. Allotype ♂, same data. Paratypes, 64 ♀♀, 8 ♂♂, same data. Holotype CAS.

Eight species of *Rhyopsocus* that have a brown head and thorax have now been described: *afer* (Africa), *bentonae* (N. America), *phillipsae* (N. America), *madagascariensis* (Madagascar), *eclipticus* (Kerguelin), *peregrinus* (Africa, U. K. stored products), *pandanicola*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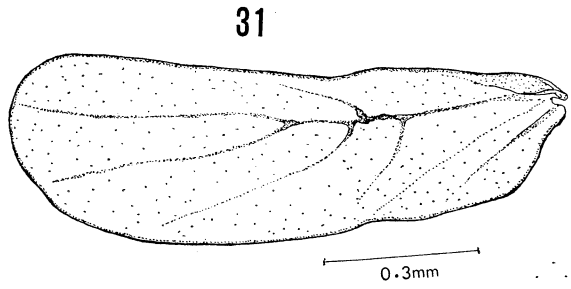
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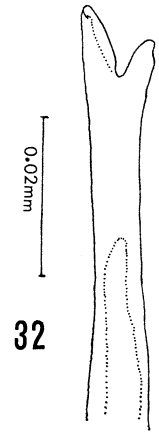
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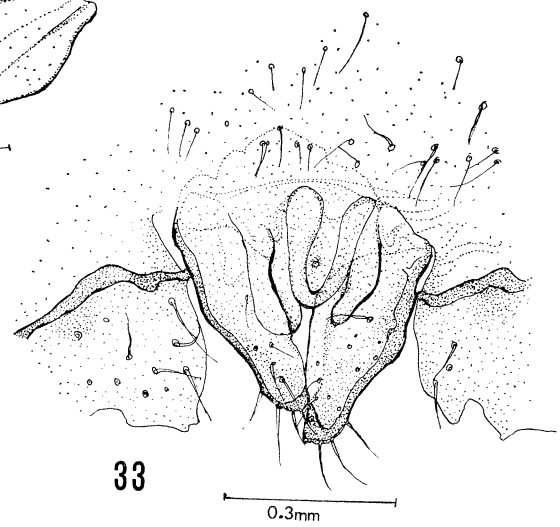
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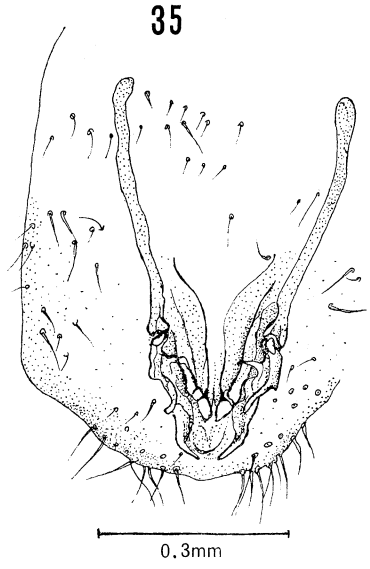
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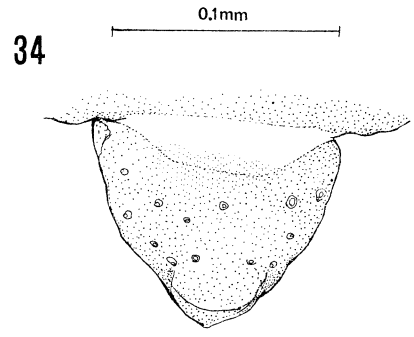
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(Micronesia) and the Galapagos species, *orthatus*, described above.

R. pandanicola is clearly distinguishable from *orthatus* in having a yellowish brown pigmented fore wing. Although *peregrinus*, like *orthatus*, has a hyaline fore wing, it differs in that *rs* is not distinctly connected to the base of the pterostigma by a cross-vein. *R. afer* is evidently variable in this respect, whereas all 74 individuals of *R. orthatus* have a distinct connection. Moreover, *afer* differs from *orthatus* quite distinctly in details of the penis bulb sclerites, and in having the anal lobe of the fore wing pigmented. The two North American species, *bentonae* and *phillipsae*, each have posteriorly projecting lobes on the ninth abdominal tergite of the ♂; in the ♂ of *orthatus* the posterior edge of this sclerotized tergite is straight, without any projections. The shape and venation of the fore wing of *orthatus* is very similar to that of *phillipsae*. *R. madagascariensis* has a fore wing of a different shape, being longer and narrower than that of *orthatus*, the costal cell is much narrower, and the stalks of r_{2-5} and m_{1+2} are unequal in length (they are of equal length in *orthatus*). *R. eclipticus* is little known, but a figure of the wings was sent to Pearman by Banks, and Pearman (1929) states that there are in the fore wing only four setae "along the upper boundary of the radial cell and ten beyond it along *rs* and r_{2+3}." *R. orthatus*, like *R. peregrinus*, has six setae along the anterior boundary of the radial cell (which in *orthatus* is closed) and 13 along *rs* and r_{2+3}.

R. spheciophilus, described from a wasp's nest in Peru, differs in coloration, and in lacking setae along the basal hind margin of the fore wing. It is not possible to comment on the affinities of *R. orthatus* without an examination and dissection of the Peruvian specimens.

Family LIPOSCELIDAE

Embidopsocus pauliani Badonnel

Embidopsocus paradoxus Enderlein. — Badonnel, 1949a: 30.
Embidopsocus pauliani Badonnel, 1955: 78.

Galapagos distribution: CHATHAM: Base of Cerro Brujo, 28. V.

Distribution elsewhere: Ivory Coast, Angola.

Embidopsocus thorntoni Badonnel

Embidopsocus thorntoni Badonnel, 1971: 325-327.

Galapagos distribution: INDEFATIGABLE: Horneman Farm, 210 m, 7.V.1964, D. Q. Cavagnaro.

Known only from the Galapagos, this species shows some slight similarity with *E. flexuosus* from the Argentine and Brazil.

Liposcelis entomophilus (Enderlein)

Troctes entomophilus Enderlein, 1907a: 34.

Fig. 30-35. *Rhyopsocus orthatus* n. sp. ♀: 30, fore wing; 31, hind wing; 32, lacinia; 33, gonapophyses; 34, epiproct. ♂: 35, hypandrium and phallosome.

Liposcelis bakeri Pearman, 1928: 133.
Liposcelis virgulatus Pearman, 1929: 106. — Badonnel, 1931: 249; 1943: 141.
Liposcelis entomophilus: Broadhead, 1947: 109. — Badonnel, 1955: 53; 1969: 35.

Galapagos distribution: DUNCAN: Upper summit, caldera area, 7.II.1964, D. Q. Cavagnaro.

Distribution elsewhere: Europe, East Africa, Central Africa, Mozambique, Portuguese Guinea, Japan, New Hebrides, Australia, Chile, Colombia, Brazil.

This cosmopolitan species, widely distributed by commerce, probably also occurs on the inhabited islands of the Galapagos.

FAMILY PACHYTROCTIDAE

Tapinella francesca Thornton & Woo, new species Plate, a–c; Fig. 36–38.

♀. *Coloration:* Head generally light buff. Epicranial suture brown. A faint light brown line extends from between orbit and antennal socket to side of clypeus. Gena white. Antenna with scape and pedicel light brown, flagellar segments brown. Maxillary palp pale, basal 2/3 of apical segment brown. Thorax buff with dorsal lobes of mesothorax and metathorax slightly darker, posterior margins brown. Two lateral brown lines on episternum extending from thorax to abdomen, one next to wing, the other near to coxae, becoming more prominent

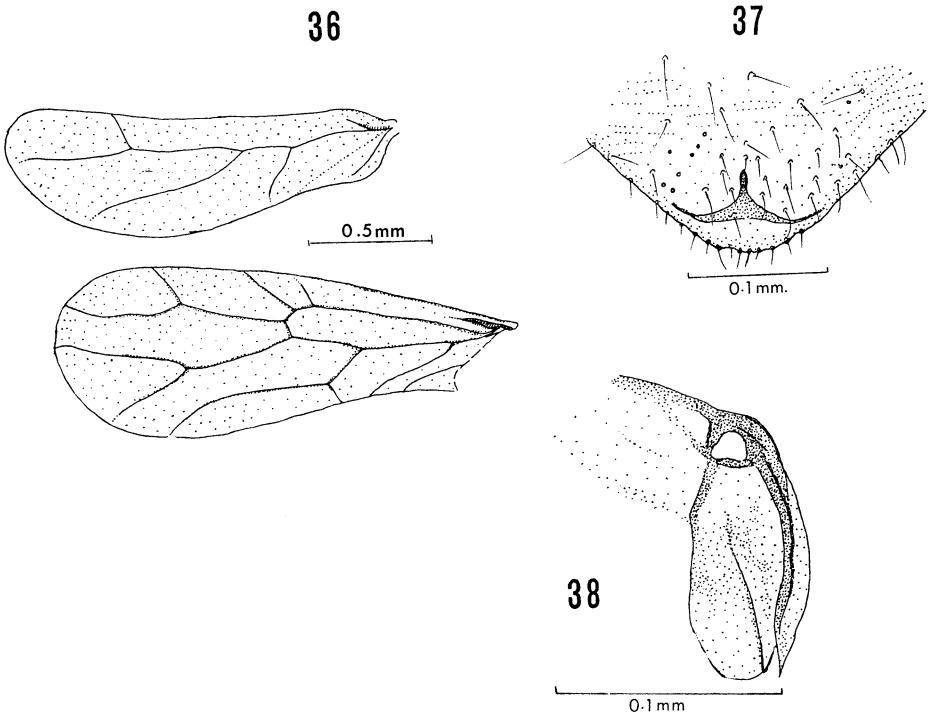

Fig. 36–38. *Tapinella francesca* n. sp. ♀: 36, hind wing, fore wing; 37, subgenital plate; 38, gonapophyses.

on abdomen. Wings and veins light brown. Legs pale; tibia and first tarsal segment slightly darker than rest. Abdomen pale with transverse discontinuous bands.

Morphology: Sculpturing of integument of vertex and lacinia as in the Plate. Venation of wings as in Fig. 36. T-shaped sclerite of subgenital plate with sclerotized tip and long curved arms, a row of short setae present on posterior margin of plate, longer setae evenly distributed above T-shaped sclerite (Fig. 37). Gonapophyses with ventral valve as long as dorsal valve (Fig. 38). Epiproct sclerotized on posterior margin and setose in posterior region. Paraproct without trichobothria.

♂. Unknown.

Holotype ♀, CHATHAM: Base of Cerro Brujo, *Scalesia divisa*, 28.V. Paratypes ♀♀, ABINGDON: 300-360 m, *Croton* and *Zanthoxylum fagara*, 8.VI; also same data as holotype. Holotype BISHOP 9913.

This species closely resembles *Tapinella mariana* Thornton, Lee & Chui from Micronesia but differs from it in the shape of the dorsal valve of the gonapophyses, sclerotization of the epiproct and the presence of stout setae anterior to the T-shaped sclerite.

T. francesca may be distinguished from the other *Tapinella* species which bears two lateral abdominal stripes, *T. curvata* (Africa), in that the frons lacks dark brown crescentic marks, and the apical fore wing veins are much less distinct in color from the membrane.

Table 5. Metric and meristic characters of *Tapinella francesca* n. sp. (lengths in mm; individual specimens represented by numbers)

Female	1	2
f_1	0. 125	—
f_2	0. 109	—
$f_1 : f_1$	1. 147	—
I. O. : D	0. 400	0. 444
Fw	1. 248	1. 295
Hw	1. 030	1. 123
Hf	0. 328	0. 343
Ht	0. 452	0. 499
t_1	0. 234	0. 230
t_2	0. 047	0. 047

Tapinella stenomedia Thornton & Woo, new species Fig. 39-41.

♀. *Coloration* (after *c.* 8 years in alcohol): Head generally uniform dark brown, antennae and palps paler. Eyes black, ocelli clear, epicranial and clypeal sutures almost black. Thorax and legs brown; pronotum of mesothorax pale. Fore wing membrane light brown, veins brown; hind wing paler. Abdomen uniform cream, except apical sclerites brown.

Morphology: Wing venation as in Figs. 39 and 40, fork of *m* in fore wing long and narrow. T-sclerite of subgenital plate (Fig. 41) with very long curved arms, between this and apical margin a number of scattered, very fine setae. Gonapophyses with fleshy dorsal and outer valve, ventral valve also fleshy, long, with sclerotised support. Paraprocts rounded, without trichobothria, epiproct setose, sclerotised along posterior margin.

Dimensions: Body length=1.500 mm. I. O.: D=3.700 Fw=1.490 mm. Hw=1.250 mm. Hf=0.450 mm. Ht=0.495 mm. t_1=0.236 mm. t_2=0.040 mm. t_3=0.450 mm. $t_1 : t_2 : t_3$=5.90 : 1 : 1.13 f_1=0.116 mm. f_2=0.125 mm. $f_1 : f_2$=0.928.

♂. Unknown.

Holotype ♀, INDEFATIGABLE: Horneman Farm, 220 m, 7.V.1964, D. Q. Cavagnaro, CAS.

Three predominantly dark species of *Tapinella* are known: *castanea* (England, in bananas), *squamosa* (Angola) and *curvata* (Congo, Angola, Nigeria (Badonnel, 1971 b)).

T. curvata can be distinguished from *stenomedia* in that the head of *curvata* has a distinctive pattern, in the fore wing *sc* is almost confluent with *c*, and the apical border of the subgenital plate bears small spines between the setae. In *stenomedia sc* in the fore wing is some distance from the wing margin, and although small setae occur on the posterior part of the subgenital plate, they are not visible along the margin. *T. stenomedia* and *T. squamosa* may be distinguished by the shape of the T-sclerite, which in *squamosa* is quite distinctive, and *africana* is unusual in having vein r_1 present in the hind wing. There is no description of the T-sclerite of *T. castanea*, but the color is described (Pearman, 1932) as "generally very deep red-brown (chestnut)", and the eyes as "reddish". The distinctive uniformly cream abdomen of *stenomedia*, and its black eyes, thus distinguish it from *castanea*, which has 2 lateral abdominal stripes.

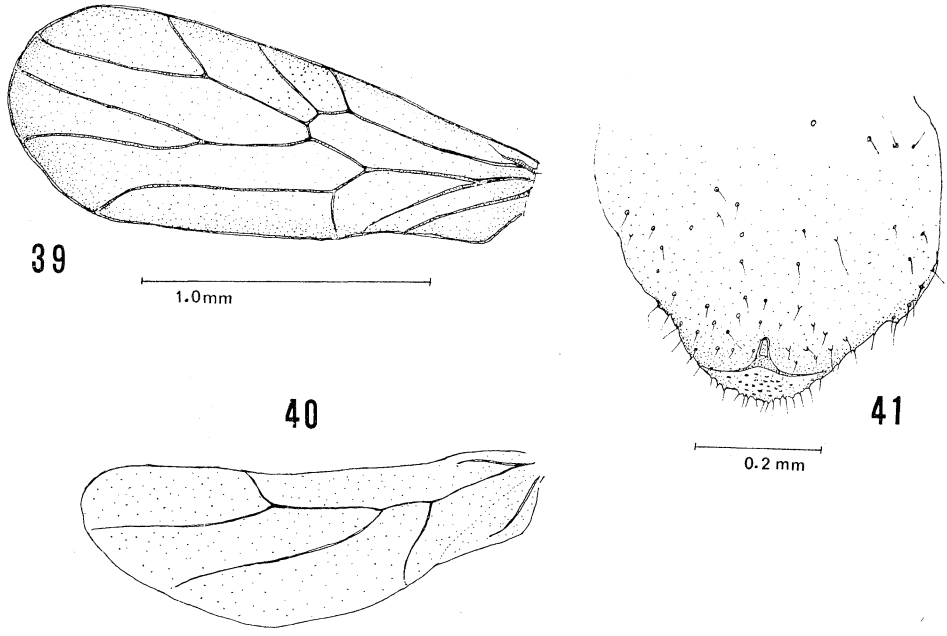

Fig. 39-41. *Tapinella stenomedia* n. sp. ♀ : 39, fore wing ; 40, hind wing ; 41, subgenital plate. Figures 39 and 40 to common scale.

Pachytroctes (Neotroctes) achrosta Thornton & Woo, new species Plate, d, e ; Fig. 42, 43.

♀. *Coloration :* Head brown with light brown area around eyes and medially on frons just above the clypeus. Clypeus with dark parallel stripes. Epicranial suture dark and distinct. Antenna with scape and pedicel brown, flagellar segments lighter in color. Maxillary palp brown, apex of last segment pale cream. Prothorax brown, mesothorax and metathorax white. Legs with coxa brown ; trochanter light brown ; femur brown, pale at distal end ; tibia brown, pale at both ends ; tarsus pale. Abdomen pale, tergum of basal segment brown, tergum of apical segment with 2 brown bands, a narrow anterior one and a wide posterior one.

Morphology : Sculpturing of integument of vertex as in Plate. Head slightly bulging around the eyes and covered with short fine hairs. Ocelli absent. Eyes very small. Lacinia 5-toothed.

Completely apterous. Mesothorax and metathorax distinguishable. Claw with a row of teeth. Subgenital plate simple with no sclerotized bar (Fig. 42). Dorsal valve of gonapophyses with rigid sclerified support (Fig. 43). Epiproct simple, setose. Paraproct without trichobothria.

Dimensions: f_1=0.127 mm. f_2=0.111 mm. f_1:f_2=1.144 I. O.: D=0.214 Hf=0.341 mm. Ht=0.429 mm. t_1=0.206 mm. t_2=0.039 mm. t_1 : t_2=5.282

♂. Unknown.

Holotype ♀ INDEFATIGABLE: Horneman Farm, 210 m, 7.V.1964, D. Q. Cavagnaro, CAS. Other specimens, INDEFATIGABLE: Turtle Bay, humus, 16.I.1965, Cavagnaro.

This species resembles the African *Pachytroctes dichromoscelis* Badonnel in external features but differs from it in lacking the distinct cross on the head and in the structure of the gonapophyses. It is also closely similar to another African species, *Pachytroctes bicoloripes* Badonnel, except for the color of the legs and thorax and the structure of the gonapophyses.

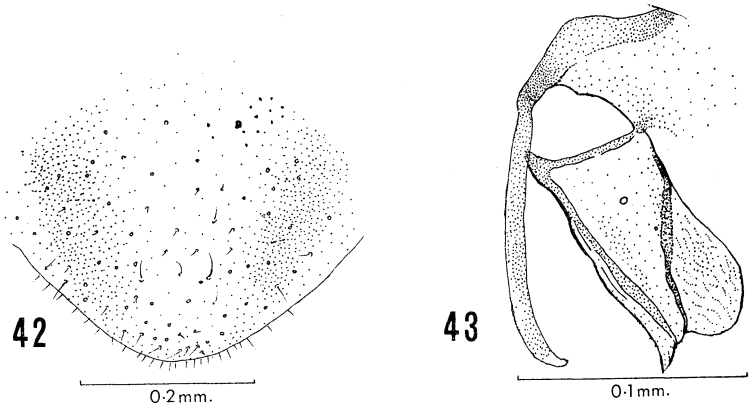

Fig. 42-43. *Pachytroctes achrosta* n. sp. ♀: 42, subgenital plate; 43, gonapophyses.

Family EPIPSOCIDAE

Epipsocus campanulatus Thornton & Woo, new species Fig. 44-47.

♂. *Coloration* (after *c.* 8 years storage in alcohol): Vertex gray-brown with paler buff patches flanking epicranial suture which is dark brown. Frons buff with lines of gray-brown granulations as follows: from near antero-mesial border of orbit a line to posterior and to anterior of ocellar protuberance, which is thus in the center of an ill-defined transverse diamond; narrow, ill-defined triangle each side with base near antennal socket and apex towards ocellar protuberance. Clypeus buff, with distinct narrow V-shaped markings posteriorly. Ocelli pale, their centripetal borders black. Eyes black. Genae gray-brown. Palpi and antennae pale straw. Thorax dorsally gray-brown except mesothoracic antedorsum pale buff, sutures dark brown. Legs wholly pale buff. Fore wing membrane very pale yellowish, veins pale brown. Hind wing hyaline, veins very pale. Abdomen buff, with broad, dark gray-brown transverse bands not extending to ventral surface.

Morphology: Fore wing (Fig. 44a) with both pterostigma and areolar postica smoothly rounded,

vein *rs* long and smoothly curved. Hypandrium (Fig. 45) broad, shallow, slightly emarginate posteriorly; well sclerotized on posterior border except medially, setae predominant on sclerotized areas. Phallosome (Fig. 46) single bell-shaped arch, apical fusion hooked in vertical plane. Epiproct (Fig. 47) broad, setose basally, apex? damaged; paraproct (Fig. 47) with a field of 25 trichobothria and mesial rugose field bearing spines and setae.

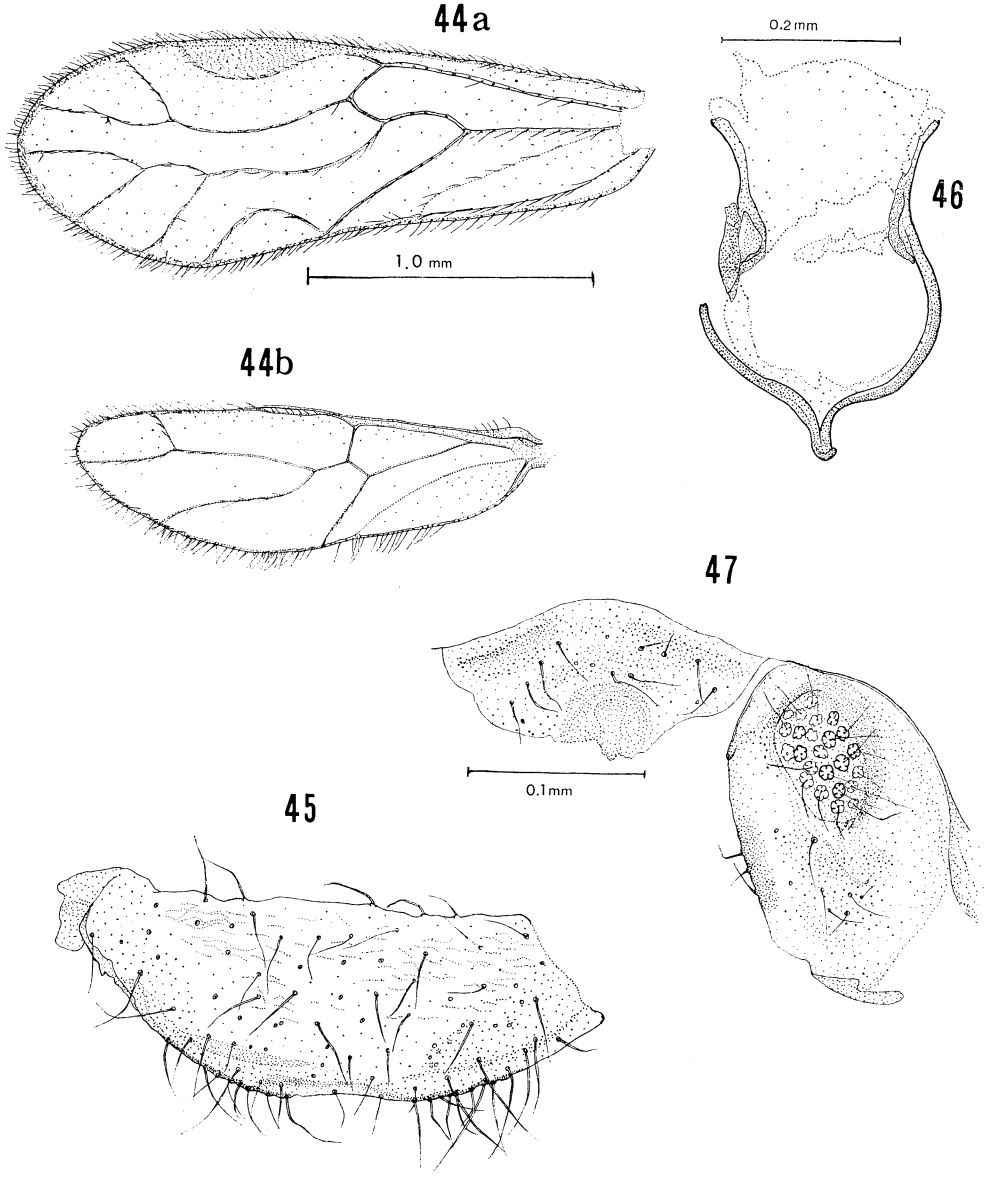

Fig. 44-47. *Epipsocus campanulatus* n. sp. ♂: 44, fore and hind wings; 45, hypandrium; 46, phallosome; 47, epiproct and paraproct. Figures 45 and 46 to common scale.

Dimensions: I. O.: D=2.500 Fw=2.620 mm. Hw=1.945 mm. Hf=0.680 mm. Ht=1.220 mm. t_1=0.540 mm. t_2=0.137 mm. t_1 : t_2=3.942 f_1=0.560 mm. f_2=0.485 mm. f_1 : f_2=1.155

♀. Unknown.

Holotype ♂, INDEFATIGABLE: Horneman Farm, 210 m, 7.V.1964, D. Q. Cavagnaro, CAS.

New (1972b) provided a key to South American *Epipsocus* species. Using this, the species above keys to *E. quurcus* Roesler, known from Brazil. Only ♀♀ of *quurcus* are known, but Roesler explicitly states that the fore wing veins are brown and very distinct. This is not the case in the Galapagos specimen, which is certainly not teneral nor is the Galapagos specimen generally dark brown, as are the ♀♀ of *E. quurcus*.

For these reasons the Galapagos specimen is described as a distinct species. Some 33 species of *Epipsocus* are known from the South American continent.

Family CAECILIIDAE

Caecilius distinctus Mockford

Caecilius distinctus Mockford, 1966: 137.

Galapagos distribution: CHATHAM: 360 m, Progreso, *Psidium guajava*, 28.II.

Distribution elsewhere: Veracruz, Surinam, Peru.

Caecilius antillanus Banks

Caecilius antillanus Banks, 1938: 288. — Mockford, 1966: 153.

Galapagos distribution: CHARLES: Plateau, *Persea gratissima*, "poma rosa," 15.III, 340 m, Wittmer Farm, "poma rosa," *Persea gratissima*, 6. V. CHATHAM: Sappho Cove, *Scutia spicata*, 27.V; near shore, *Cassia picta*, 13.IV.

Distribution elsewhere: Southern half of Florida, South and Central Mexico, Greater Antilles, Virgin Is., Central America, northeastern coast of South America.

Mockford (1966) suggests that this species may be parthenogenetic. No ♂♂ were found in the Galapagos.

Caecilius insularum Mockford

Caecilius insularum Mockford, 1966: 157.

Galapagos distribution: ALBEMARLE: (Sierra Negra), 300 m, underside of almendro leaves, 28.IV. JAMES: 390 m, *Persea gratissima*, 20.IV. INDEFATIGABLE: Above Bella Vista, Scalesia, *Persea gratissima*, 24.III.; E. slope, 150 m, on lichen on trees, 16.IV. 1964: Horneman Farm, 200 m, 7.V.1964, Cavagnaro.

Distribution elsewhere: Southern Florida, Bahamas, Greater Antilles, Virgin Is., Central Veracruz in Mexico, Panama, northern coast of South America from Venezuela south to Surinam.

Widely distributed in the New World Tropics, associated particularly with introduced plants, including *Citrus* which is grown on the three Galapagos islands on which it occurs. On all three islands, the species was collected from farms or abandoned farms.

FAMILY LACHESILLIDAE

Lachesilla aethiopica (Enderlein)

Pterodela pedicularia aethiopica Enderlein, 1902: 11.
Lachesilla aethiopica: Badonnel, 1949b: 53.

Galapagos distribution: JAMES: Dead overhanging ferns, 490 m, 20.IV. INDEFATIGABLE: Occidente, *Citrus* sp, tomato, 22.III; above Bella Vista, *Scalesia*, *Citrus* sp., 23-24.III; Horneman Farm, 210 m, 7.V.1964, Cavagnaro. CHARLES: Plateau, *Mangifera indica*, 15.III; 340 m, *Mangifera* indica, 8.V.

Distribution elsewhere: Congo, West Indies, Central America, Brazil (Badonnel *in litt.*).

Found only on large Galapagos islands inhabited by man; probably also occurs on Chatham. No ♂♂ were found. Metric and meristic characters of Galapagos specimens are given in Table 6.

Table 6. Metric and meristic characters of *Lachesilla aethiopica* (End.) (lengths in mm; individual specimens represented by numbers)

Female	1	2	3	4
f_1	0. 160	0. 180	0. 180	0. 180
f_2	0. 160	0. 180	0. 160	0. 180
$f_1 : f_2$	1. 000	1. 000	1. 125	1. 000
Fw	1. 660	1. 720	1. 580	1. 740
Hw	1. 280	1. 322	1. 160	1. 340
Hf	0. 340	0. 360	0. 340	0. 380
Ht	0. 620	0. 680	0. 600	0. 680
t_1	0. 200	0. 200	0. 180	0. 200
t_2	0. 080	0. 080	0. 080	0. 080
$t_1 : t_2$	2. 500	2. 500	2. 250	2. 500
Ct	16	17	15	16

Lachesilla castroi Thornton & Woo, new species Fig. 48-54.

♀. *Coloration:* Head and body generally yellowish with brown markings. Epicranial suture and frons-vertex suture brown and distinct. Faint brown patches around eye and on both sides of epicranial suture. Frons with a median brown patch, sometimes connected by 2 thin stripes to vertex-frons suture. A wide brown band extends from orbit to antennal socket. Clypeus with about 12 mesially directed brown lines. Maxillary palp with basal segment pale, 2nd segment light brown and apical segment brown. Antenna with scape and pedicel brown, f_1 pale, f_2, f_3 and f_4 successively darker, f_5 and subsequent segments dark brown. Mesothorax and metathorax tan. A brown band runs laterally from behind head to metathorax. Fore wing (Fig. 48) hyaline, brown clouded areas near distal ends of veins r_{2+3}, r_{4+5}, m_1, m_2, m_3, r_1, cu_1 and cu_2, veins otherwise faint, dark spots at stigmasac and anal angle. Hind wing (Fig. 49) hyaline, all veins dark. Abdomen pale with brown transverse bands.

Morphology: Subgenital plate (Fig. 50) with a small projection at posterior margin; anterior to this, a distinct sclerotized V-shaped mark. Gonapophyses (Fig. 51) club-like, setose. Para-

proct with 13 trichobothria.

♂ *Coloration:* As ♀, except abdominal bands more conspicuous.

Morphology: Usually smaller than ♀. Phallosome (Fig. 52) with 2 pairs of claspers, the outer claspers consisting of 2 triangular projections with blunt tips, the inner claspers resembling crossed hooks. Parameres in form of 2 thin rod-like structures joined basally, free ends slightly stouter. Hypandrium (Fig. 53) small, rectangular, simple, with triangular patch of sclerotiza-

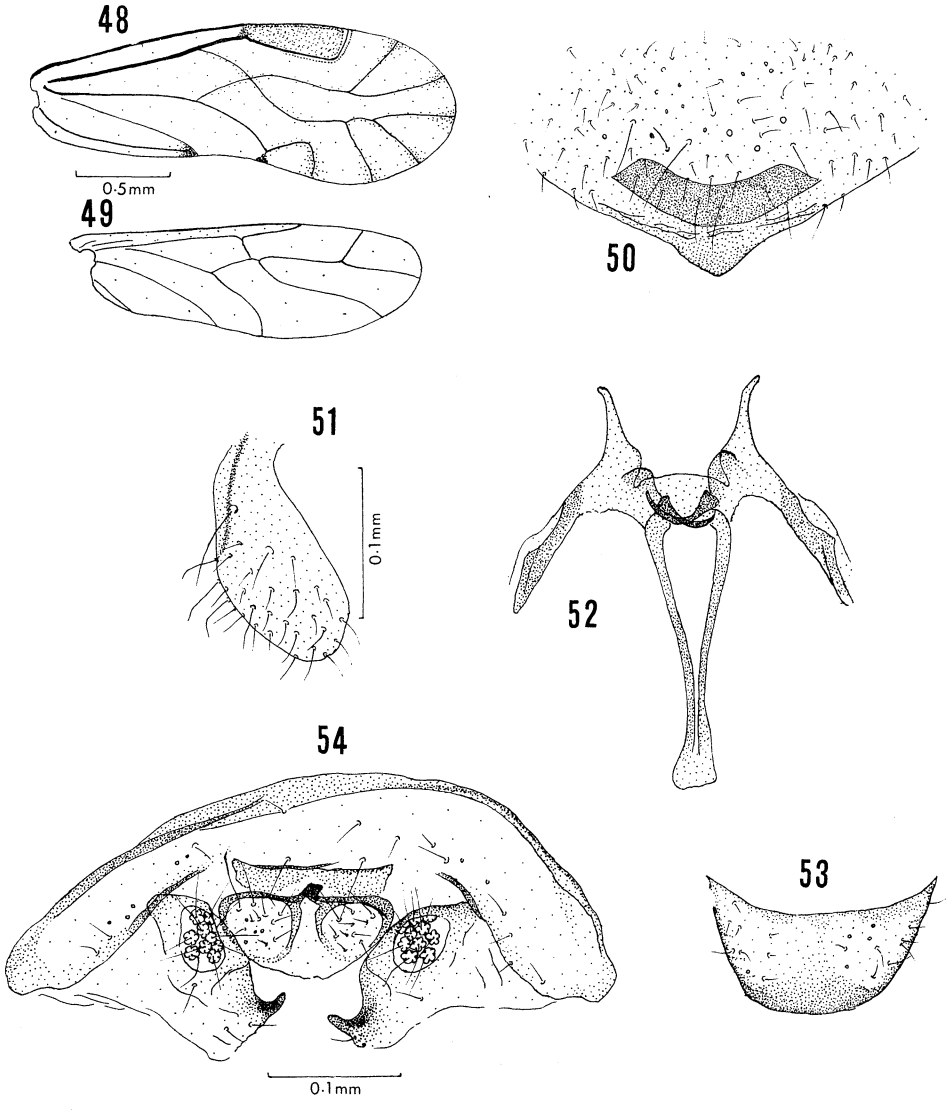

Fig. 48–54. *Lachesilla castroi* n. sp. ♀ : 48, fore wing; 49, hind wing; 50, subgenital plate; 51, gonapophyses. ♂ : 52, phallosome; 53, hypandrium; 54, epiproct and paraprocts. Figures 50, 52, 53 and 54 to common scale.

tion at posterior margin. Epiproct (Fig. 54, paratype) with two fields of setae separated by a spectacle-like sclerotization, "bridge" of spectacles a dorsally projecting flattened rod, 4 × as long as wide. Paraproct with strong posterior prong.

Table 7. Metric and meristic characters of *Lachesilla castroi* n. sp. (lengths in mm; individual specimens represented by numbers)

Female	1	2	3	4	5
f_1	0.199	0.206	0.183	0.214	0.175
f_2	0.159	0.159	0.151	0.167	0.143
$f_1 : f_2$	1.252	1.300	1.211	1.286	1.222
I. O. : D	0.333	0.340	0.320	0.360	0.320
Fw	1.360	1.640	1.440	1.660	1.520
Hw	1.100	1.260	1.160	1.320	1.160
Hf	0.340	0.340	0.320	0.360	0.320
Ht	0.600	0.640	0.580	0.660	0.600
t_1	0.180	0.200	0.180	0.220	0.180
t_2	0.080	0.080	0.080	0.100	0.080
$t_1 : t_2$	2.250	2.500	2.250	2.200	2.250
Ct	12	18	14	18	15
Male	1	2	3	4	5
f_1	0.198	0.230	0.238	0.222	0.238
f_2	0.159	0.191	0.191	0.183	0.198
$f_1 : f_2$	1.245	1.204	1.246	1.213	1.202
I. O. : D	0.400	0.556	0.400	0.400	0.400
Fw	1.280	1.540	1.520	1.440	1.460
Hw	0.980	1.220	1.180	1.120	1.160
Hf	0.300	0.320	0.320	0.320	0.320
Ht	0.560	0.620	0.620	0.600	0.600
t_1	0.180	0.220	0.200	0.200	0.200
t_2	0.080	0.080	0.080	0.080	0.080
$t_1 : t_2$	2.250	2.750	2.500	2.500	2.500
Ct	14	16	17	13	15

Holotype ♀, CHATHAM: near shore, Wreck Bay, *Cassia picta* with dry pods, 13.IV. Allotype ♂, TOWER: 45 m, crater edge, *Bursera malacophylla*, *Cordia lutea*, 8.III. Paratypes, NARBOROUGH: Punta Espinosa, *Laguncularia racemosa*, 27.III. JERVIS: lagoon, *Maytenus obovata* and dead twigs, 21.IV. BRATTLE: summit 90 m, *Periloba galapagensis*, 31.III. CHATHAM: Same data as holotype. Other specimens, WENMAN: W. cliff, 230 m, *Scalesia* and *Croton*, 9.VI. ABINGDON: 180–210 m, *Pisonia floribunda*, dead leaves, 18.V. JAMES: Buccaneer Bay, *Castela galapagea*, 12.VI. BINDLOE: S. beach, *Cordia lutea*, 16.V. INDEFATIGABLE: Academy Bay, 12.II.1964, Bella Vista trail, *Scalesia*, 11.II.1964, Turtle Bay, humus, 19.I.1965, D. Q. Cavagnaro. CHARLES: Black Beach, *Prosopis* sp. and *Clerodendron molle*, 5.V. CHATHAM: base of Cerro Pitt, *Scalesia incisa*, 26.V; base of Cerro Brujo, *Encelia hispida*, 28.V. Holotype BISHOP 9914.

This species resembles the North American species *Lachesilla pallida* Sommerman (in the cross-hooked claspers) and *Lachesilla riegeli* Sommerman (in having 2 pairs of claspers). Named after S. Miguel Castro, Conservation Officer of the Charles Darwin Research Station.

Family ECTOPSOCIDAE

Ectopsocus maindroni Badonnel

Ectopsocus maindroni Badonnel, 1935: 81. — Ball, 1943: 6. — Badonnel, 1946: 180; 1948: 316; 1949a: 43; 1955: 185. — Thornton, 1962a: 453; 1962b: 299; 1964: 286. — Mockford, 1965: 112. — Thornton & Wong, 1968: 13. — Thornton, Lee & Chui, 1972: 102.
Ectopsocus cryptomeriae Jentsch, 1939: 111.

Galapagos distribution: ALBEMARLE: Sierra Negra, 200 m, "tilo" (mountain ash), 29.IV; shore, *Annona* sp, 30.IV. INDEFATIGABLE: Academy Bay, 12.II.1964, Horneman Farm, 210 m, 7.V.1964, Cavagnaro. TOWER: 15 m, crater lake, mangrove, 8.III. CHATHAM: Progreso, 360 m, *Psidium guajava*, 28.II; near shore, Wreck Bay, *Scutia spicata*, *Cassia picta*, 13.IV.

Distribution elsewhere: England, Ivory Coast, Congo, Angola, Arabia, Philippines, Palawan, Hong Kong, Malaysia, India, Micronesia, Hawaiian Is., Japan, U. S. A., Mexico.

This cosmopolitan species is associated with the dwellings and produce of man, and has also been found in natural situations, on vegetation and in caves. Except for the Tower collection, the Galapagos specimens were all collected near inhabited areas. The species has been found in air traps on ships in the Indian and Pacific Oceans, although these captures may have been the result of pest infestation.

Ectopsocus meridionalis Ribaga

Ectopsocus briggsi meridionalis Ribaga, 1904: 294; Badonnel, 1943: 100.
Ectopsocus meridionalis: Enderlein, 1907b: 101. — Okamoto, 1910: 189. — Rosen, 1911: 8. — Takahashi, 1938: 12. — Jentsch, 1939: 126. — Sofner, 1941: 323. — Ball, 1943: 4. — Badonnel, 1943: 100; 1945: 44; 1946: 179; 1955: 185. — Mockford, 1959: 262. — Smithers, 1960a: 371. — Mockford, 1961: 136. — Badonnel, 1963: 335. — Thornton & Wong, 1968: 28.
Ectopsocus meridionalis subsp. *tridentatus* Thornton, 1962b: 300.

Galapagos distribution: ALBEMARLE: Volcan Wolf, 1570 m, *Duranta*, 20.V; Volcan Alcedo, 1600 m, crater rim, *Zanthoxylum fagara*, 1.V; Sierra Negra, 180 m, *Citrus* sp., 200 m, "tilo" (Mountain Ash), 29.IV. ABINGDON: 360m and 500 m, *Pisonia floribunda*, 17.V; 180–390 m, *Pisonia floribunda*, *Zanthoxylum fagara* and lichen, *Chiococca alba*, 18.V; 300–360 m, *Croton* and *Zanthoxylum fagara*, 8.VI. JAMES: 580–640 m, *Pisonia floribunda*, *Zanthoxylum fagara*, dead tree with lichen, dead *Croton*, 19–20.IV; 490 m, dead overhanging ferns near water, 20.IV. INDEFATIGABLE: Occidente, tomato, *Citrus* sp., 22,24.III; above Bella Vista, *Scalesia*, *Persea gratissima*, "poma rosa", 24.III; above Medialuna, *Miconia*, 5.IV. CHARLES: plateau, 300 m, *Mangifera indica*, *Persea gratissima*, "poma rosa", 15.III; 340 m, Wittmer Farm, *Persea gratissima*, 6.V. CHATHAM: 360 m, Progreso, *Psidium guajava*, 28.II; 460 m, E of El Junco, *Miconia* with moss and lichen, 180 m, below and 1 km SE of El Junco (670 m), *Miconia*, 480 m, near El Junco, *Miconia*, 13.IV.

Distribution elsewhere: Europe, Mozambique, Cameroons, Morocco, Congo, Angola, Natal, Tanganyika, Hong Kong, Taiwan, Japan, Hawaiian Islands, N. America, Chile, Mexico, Colombia.

Ectopsocus richardsi (Pearman)

Chaetopsocus richardsi Pearman, 1929: 105. — Richards & Herford, 1930: 367. — Kimmins, 1941: 94. — Pearman, 1942: 290. — Zimmerman, 1948: 233.
Ectopsocus richardsi: Pearman, 1942: 290. — Mockford & Gurney, 1956: 363. — Pearman, 1960: 248. — Thornton, 1962b: 300.

Galapagos distribution: INDEFATIGABLE. Not found in the present study.

Distribution elsewhere: England, West Africa, Hong Kong, Hawaii, Texas.

This species is also associated with stored products, and the single record from the Galapagos was from an upland farm.

Ectopsocus sp.

Similar to *Ectopsocus strauchi* from the Canaries and Azores. To be described by Dr S. K. Wong.

Galapagos distribution: WENMAN, NARBOROUGH, ALBEMARLE (Darwin, Sierra Negra), ABINGDON, JAMES, DUNCAN, N. SEYMOUR, INDEFATIGABLE, S. PLAZA, CHARLES, TOWER, HOOD (Gardner), CHATHAM.

FAMILY PERIPSOCIDAE

Peripsocus pauliani Badonnel

Peripsocus pauliani Badonnel, 1949b: 42. — Thornton & Wong, 1968: 20. — Thornton, Lee & Chui, 1972: 107.

Galapagos distribution: WENMAN: W. cliff, 230 m, *Scalesia* and *Croton*, 9.VI; NW, 55 m, Booby plateau, *Croton*, 10.VI. NARBOROUGH: Punta Espinosa, *Avicennia nitida*, *Laguncularia racemosa*, 27.III. ALBEMARLE: Volcan Wolf, 550 m, *Lippia rosmarinifolia*, 20.V; Tagus Cove, *Castela galapagea* with encrusting lichen, 29.III; Volcan Alcedo, 610 m, *Pisonia floribunda*, 1.V; Cerro Azul, 970 m, dead tree, 26.IV. BRATTLE: 55–90 m, *Periloba galapagensis*, *Croton scouleri*, 18.V. JAMES: 580 m, dead *Croton*, James Bay, *Acacia*, 390 m, *Persea gratissima*, 20.IV; Buccaneer Bay, *Castela galapagea*, 12.VI. JERVIS: lagoon, *Maytenus obovata* and dead twigs, 21.IV. DUNCAN: anchorage to 120 m, *Prosopis*, *Rhizophora mangle*, and *Maytenus obovata*, 18,21.IV. BINDLOE: S. beach, *Cordia lutea*, 16.V. INDEFATIGABLE: Academy Bay, 15 m, *Acacia*, 2.III, *Croton scouleri*, 7.IV; above Bella Vista, *Scalesia*, 24.III. CHARLES: 300 m, plateau, *Mangifera indica*, "guanavano", *Psidium guajava*, *Citrus* sp., "poma rosa", 15.III; Black Beach, *Prosopis* sp., 5, 7.V.; 340 m, *Clerodendron molle*, *Solanum* sp. ("ciruella"), "guanavano", "poma rosa", *Persea gratissima*, *Mangifera indica*, 6.V. TOWER: shore to 45 m, mangrove, *Bursera malacophylla*, *Cordia lutea*, *Croton*, 8.III. CHATHAM: 360 m, Progreso, *Psidium guajava*, 28.II; 520 m, near El Junco, *Psidium guajava*, 11.IV; 460 m, valley E. of El Junco, *Miconia*, 11.IV; near shore, *Scutia spicata*, *Zanthoxylum fagara*, *Croton scouleri*, *Cassia picta* with dry pods,

13.IV; base of Cerro Pitt, *Scutia spicata*, *Scalesia incisa*, dead twigs and lichen, 26.V; base of Cerro Brujo, *Maytenus obovata*, *Cryptocarpus* and *Roccella*, *Encelia hispida*, 28.V. HOOD: SW, 90–150 m, *Acacia*, *Cordia lutea*, 14.III; pools, *Cordia lutea*, 13.III. ABINGDON: 400 m, *Pisonia floribunda*, 17.V.

Distribution elsewhere: Africa, Malaysia, Hong Kong, Philippines, Micronesia.

This species is probably parthenogenetic. ♂♂ have not yet been discovered.

Peripsocus stagnivagus Chapman

Peripsocus stagnivagus Chapman, 1930: 376.

Galapagos distribution: NARBOROUGH: Punta Espinosa, *Avicennia nitida*, 27.III. ALBEMARLE: Volcan Wolf, 1570 m, *Scalesia*, 20.V; Black Cove, *Laguncularia racemosa*, 27.III; Tagus Cove, *Castela galapagea* with encrusting lichen, dead stump *Cordia lutea* with lichen, 29.III; Sierra Negra, 685 m, *Psidum guajava*, 970 m, crater rim, *Zanthoxylum fagara*, 28.IV; Cerro Azul, 1300 m, *Psidium galapagea*, 26.IV. BRATTLE: 55–90 m, *Periloba galapagensis*, *Croton scouleri*, 31.III. ABINGDON: 210–500 m, *Pisonia floribunda*, *Zanthoxylum fagara* and lichen, *Croton*, *Scalesia*, 17,18.V, 8.VI. JAMES: 580 m, *Pisonia floribunda*, dead tree with lichen, 19.IV; 170 m, *Hippomane mancinella*, 390 m, *Persea gratissima*, 20.IV; James Bay, *Acacia*, 490 m, water drip, dead overhanging ferns, 20.IV; Buccaneer Bay, *Castela galapagea*, 12.VI. JERVIS: lagoon, *Maytenus obovata* and dead twigs, 21.IV. DUNCAN: anchorage to 120 m, *Prosopis*, 18.IV. BINDLOE: S. beach, *Cordia lutea*, 45 m, *Croton*, 16.V. INDEFATIGABLE: Bella Vista, *Persea gratissima*, "poma rosa", 24.III; Academy Bay, *Croton scouleri*, 7.IV. CHARLES: Black Beach, *Prosopis* sp. and *Clerodendron molle*, 5, 7.V: TOWER: crater lake, *Mangifera indica*, 15 m, *Bursera malacophylla* and *Cordia lutea*, shore to 45 m, crater rim, *Bursera malacophylla*, *Cordia lutea*, and *Croton*, 8.III. BARRINGTON: W., 60 m, *Cordia lutea*, 13.V. CHATHAM: 360 m, Progreso, *Psidium guajava*, 28.II; 520 m, near El Junco, *Psidium guajava*, 10.IV; 1 km S of El Junco, *Psidium guajava*, 11.IV; 460 m, valley E of El Junco, *Miconia*, 11.IV; near shore, *Scutia spicata*, *Zanthoxylum fagara*, *Cassia picta* with dry pods, 13.IV; base of Cerro Pitt, dead twigs, lichen, 26.V; base of Cerro Brujo, *Maytenus obovata*, *Cryptocarpus*, *Roccella*, dead *Croton*, 28.V.

Distribution elsewhere: U. S. A.

Peripsocus sp.

This species is very similar to *Peripsocus nitens* found in New Zealand and Hawaii. In the Galapagos, it has only been collected at altitudes of about 500 m and above. To be described by Dr S. K. Wong.

Galapagos distribution: ALBEMARLE (Sierra Negra, Cerro Azul), James.

Peripsocus potosi Mockford

Peripsocus potosi Mockford, 1971: 110.

Galapagos distribution: ALBEMARLE: Volcan Alcedo, 460–610 m, *Pisonia floribunda*, *Zanthoxylum fagara* and lichen, 1.V; Sierra Negra, 360 m, *Psidium guajava*, 970 m, crater rim,

Zanthoxylum fagara, 28.IV; 200 m, "tilo" (Mountain Ash), 180 m, *Psidium guajava*, *Achras sapota*, *Citrus* sp., 29.IV; Cerro Azul, 1300 m, *Zanthoxylum fagara*, 26.IV. ABINGDON: 180–500 m, *Zanthoxylum fagara*, *Pisonia floribunda*, *Scalesia*, *Croton scouleri*, 17–18.V; 300–390 m, *Croton* and *Zanthoxylum fagara*, 8.VI. JAMES: 580 m, *Pisonia floribunda*, dead tree with lichen, IV; 390–610 m, *Sapindus saponaria*, *Croton scouleri*, *Pisonia floribunda*, *Persea gratissima*, dead overhanging ferns, 20.IV. INDEFATIGABLE: Occidente, *Citrus* sp., tomato, 22, 24.III; Bella Vista, *Persea gratissima*, 24.III. CHARLES: 340 m, Wittmer Farm, *Solanum* sp. ("ciruella"), "guanavano", *Mangifera indica*, 6.V; Black Beach, *Prosopis* sp., 7.V; plateau, 300 m, *Mangifera indica*, *Persea gratissima*, 15.III. CHATHAM: 360 m, Progreso, *Psidium guajava*, 28.II; below El Junco, 460 m, large tree, 10.IV; 520 m, near El Junco, *Psidium guajava*, 10.IV; 460 m, 1 km S of El Junco, *Psidium guajava*, 11.IV.

Distribution elsewhere: Mexico, Costa Rica, Guatemala, Puerto Rico, Trinidad, Jamaica.

Family PSEUDOCAECILIIDAE

Pseudocaecilius criniger (Perkins)

Elipsocus criniger Perkins, 1899: 85.
Kilauella criniger: Enderlein, 1913: 357; 1920: 456. — Zimmerman, 1948: 239.
Pseudocaecilius elutus Enderlein, 1903: 261; 1926: 58. — Soehardjan, 1958: 31. — Thornton, 1961: 141. — Lee & Thornton, 1967: 83. — Thornton, Lee & Chui, 1972: 112.
Pseudocaecilius elutus var. *africanus* Badonnel, 1931: 230; 1946: 168; 1948: 292; 1955: 200; 1959: 18. — Smithers, 1960b: 221; 1964: 253.
Pseudocaecilius (Pseudocaecilius) elutus: Roesler, 1944: 152.
Pseudocaecilius criniger Thornton, Lee & Chui, 1972; 112.

Galapagos distribution: ALBEMARLE: Sierra Negra, 180 m, *Psidium guajava*, *Achras sapota*, 60 m, 9 km NE of Villamil, *Zanthoxylum fagara* and lichen, shore, *Annona* sp., 29, 30.IV. ABINGDON: 180–300 m, beating, 18.V. JAMES: 170 m, *Hippomane mancinella*, 20.IV; 255 m, *Psychotria rufipes*, 580 m, *Pisonia floribunda*, dead tree with lichen, 19.IV. INDEFATIGABLE: Academy Bay, *Maytenus obovata*, 7.IV. CHARLES: plateau, 300 m, *Persea gratissima*, 15.III. HOOD: E., pools, *Cordia lutea*, 13.III.

Distribution elsewhere: Congo, S. Africa, Madagascar, Mozambique, Angola, India, S. China, Malaysia, Singapore, Java, Micronesia, Hawaii, possibly also southern United States, Puerto Rico, Taiwan.

Pseudocaecilius tahitiensis (Karny)

Epipsocus tahitiensis Karny, 1926: 288.
Pseudocaecilius tahitiensis: Lee & Thornton, 1967: 79. — Thornton, Lee & Chui, 1972: 113.

Galapagos distribution: ALBEMARLE: Punta Albemarle, *Laguncularia racemosa*, 19.V; Black Cove, *Rhizophora mangle*, 27.III; Villamil shore, *Annona* sp., 29.IV: JAMES: 255 m, *Psychotria rufipes*, 640 m, *Zanthoxylum fagara*, 19.IV. JERVIS: lagoon, dead twigs and *Maytenus obovata*, 21.IV. NORTH SEYMOUR: 15 m, *Bursera malacophylla*, 3.III; *Maytenus obovata*, 7.IV. INDEFATIGABLE: Academy Bay, *Maytenus obovata*, 7.IV. CHARLES: Black Beach, *Prosopis* sp., *Clerodendron molle*, 5.V. CHATHAM: near shore, *Croton scouleri*, *Cassia picta* with dry pods, 13.IV; Sappho Cove, *Scutia spicata*, 27.V; base of

Cerro Brujo, *Castela galapagea*, 28.V.

Distribution elsewhere: Tahiti, Micronesia (S. Mariana Is.).

This species is very similar to *Pseudocaecilius criniger* (Perkins) (Lee & Thornton, 1967) but can be distinguished by the following external characters:

1. The pterostigma in *P. criniger* is narrower with a more acute apex and darker stigmasac than *P. tahitiensis*.
2. In *P. criniger*, the brown band between eye and antennal socket is much narrower than the lateral body stripe. In *P. tahitiensis*, the band is almost as wide as the lateral body stripe.
3. Two brown patches are present on the dorsal lobes of the mesothorax in *P. criniger* but absent in *P. tahitiensis*.
4. Differences in pigmentation of fore wing:
   a) *P. tahitiensis* has a spotty appearance. Cloudy spots are present at the distal ends of veins r_{2+3}, r_{4+5}, m_1, m_2, and m_3. In *P. criniger*, these veins are brown for their entire lengths, with no spots at the tips.
   b) The brown band in the aerola postica is at a more acute angle in *P. tahitiensis* than in *P. criniger*.

Family ARCHIPSOCIDAE

Archipsocus (Archipsocus) spinosus Thornton, Lee & Chui

Archipsocus (Archipsocus) spinosus Thornton, Lee & Chui, 1972: 126.

Galapagos distribution: ALBEMARLE: Tagus Cove, *Castela galapagea* with encrusting lichen, 29.III; Black Cove, *Laguncularia racemosa*, 27.III; Cerro Azul, 150 m, dead twigs, 27.IV. BRATTLE: 55 m, *Croton scouleri*, 60 m, *Periloba galapagensis*, 31.III. ABINGDON: 180–300 m, various trees, 18.V; 360–390 m, *Croton*, 8.VI. INDEFATIGABLE: above Bella Vista, "poma rosa", 25.III; Academy Bay, *Maytenus obovata*, *Croton scouleri*, 7.IV. BARRINGTON: 60 m, W. end, *Cordia lutea*, 13.V. CHATHAM: Sappho Cove, *Hippomane mancinella*, 27.V.

Distribution elsewhere: Micronesia (S. Mariana Is.).

Only ♀♀ of this species were found. General coloration is slightly darker than the original description, with the head brown, the thorax and legs light brown and the abdomen yellowish.

Family PHILOTARSIDAE

Aaroniella galapagensis Thornton & Woo, new species Fig. 55–63.

♀. *Coloration:* Head generally yellowish tan with brown markings. Epicranial suture brown. Ocelli pale with dark brown inner borders. Frons with a median brown patch. Clypeus with usual parallel marks, median 2 stripes fuse to form a triangular patch. Gena dark brown. Maxillary palp with 2 basal segments light brown, 3rd segment brown and apical segment dark brown. Antenna with scape and pedicel brown, flagellar segments light brown, white at joints. Diffuse brown patches on dorsal lobes of mesothorax and metathorax, posterior margins brown, scutellum cream. Episternum dark brown. Wing pigmentation as in Figs. 55 and 56. Legs with coxa brown; femur brown, pale distally; tibia yellowish; tarsus brown.

Morphology: Head covered with hairs, particularly long and stout at posterior margin of head. Eyes small. Ocelli large with anterior ocellus slightly smaller. Brachypterous. Apex of subgenital plate (Fig. 57) with a small round sclerite bearing 2 long setae. Remainder of plate consists of a V-shaped pigmented area, posterior 1/2 of plate without setae. Gonapophyses (Fig. 58) with ventral valve tapering to a blunt end bearing a few short fine setae; dorsal valve with a pointed spinous area a little distance ventral to the apex; outer valve triangular with rounded apices and bearing numerous long setae. Spermapore plate (Fig. 59) well developed.

♂. *Coloration:* Similar to ♀ except frons mark is elongated into a median brown band. Mesothorax much darker than metathorax, dorsal lobe completely brown except for a slightly lighter stripe running across it diagonally and joining the pale median stripe between the 2 lobes. Fore wing (Fig. 60) hyaline, veins brown. Pigmented spots around hair sockets absent. Pterostigma with brown pigment bordering a central hyaline area. Hind wing (Fig. 61) completely hyaline.

Morphology: Macropterous. Vein *an* of fore wing without setae. In hind wing *rs* setose a little distance after separation from *m*. Hypandrium (Fig. 62) simple, emarginate at posterior border, setose. Phallosome (Fig. 63) with complex accessory sclerites.

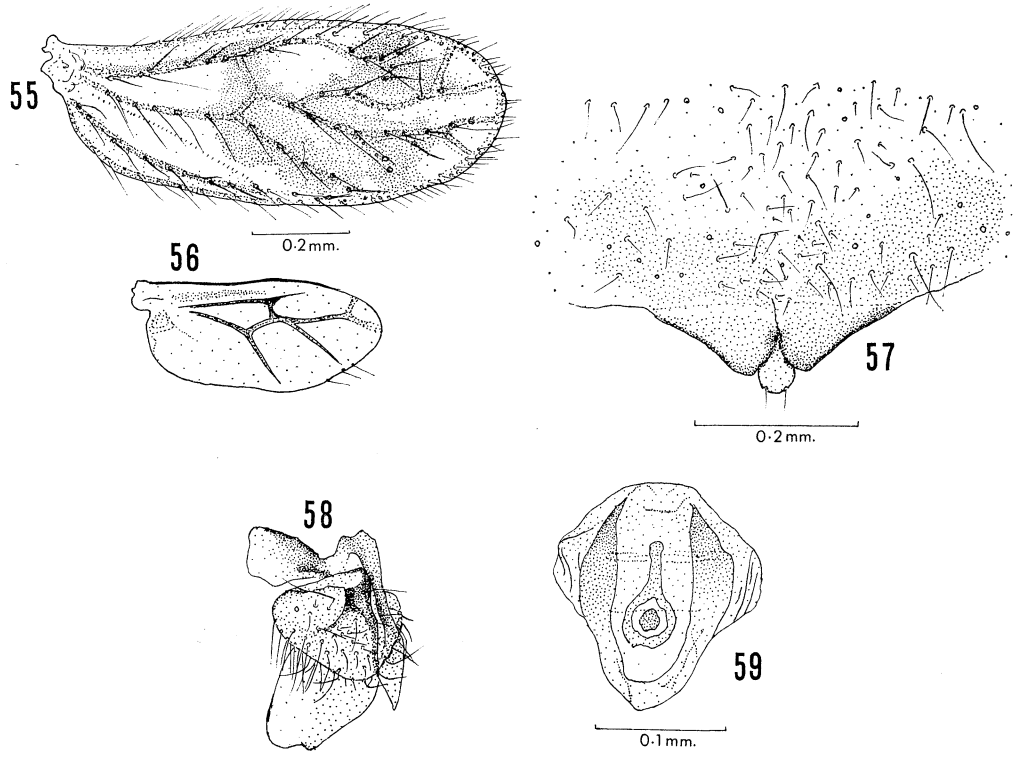

Fig. 55–59. *Aaroniella galapagensis* n. sp. ♀ : 55, fore wing; 56, hind wing; 57, subgenital plate; 58, gonapophyses; 59, spermapore plate. Figures 57 and 58 to common scale.

Table 8. Metric and meristic characters of *Aaroniella galapagensis* n. sp. (lengths in mm; individual specimens represented by numbers)

Female	1	2	3	4
f_1	0. 220	0. 140	0. 200	0. 180
f_2	0. 120	0. 060	1. 120	0. 100
$f_1 : f_2$	1. 833	2. 333	1. 667	1. 967
I. O. : D	0. 294	0. 313	0. 375	0. 313
Fw	0. 620	0. 460	0. 980	0. 900
Hw	0. 380	0. 260	0. 520	0. 520
Hf	0. 560	0. 440	0. 560	0. 520
Ht	0. 680	0. 520	0. 680	0. 640
t_1	0. 200	0. 140	0. 200	0. 200
t_2	0. 040	0. 020	0. 020	0. 040
$t_1 : t_2$	5. 000	7. 000	10. 000	5. 000
Ct	0	0	0	0
Tr	4, 3	3, 3	5, 4	5, 4
Male	1	2	3	
f_1	0. 303	0. 273	0. 333	
f_2	0. 182	0. 182	0. 212	
$f_1 : f_2$	1. 665	1. 500	1. 571	
I. O. : D	0. 429	0. 462	0. 400	
Fw	1. 879	1. 697	2. 000	
Hw	1. 485	1. 333	1. 727	
Hf	0. 424	0. 485	0. 576	
Ht	0. 758	0. 636	0. 788	
t_1	0. 242	0. 212	0. 273	
t_2	0. 030	0. 030	0. 045	
$t_1 : t_2$	8. 067	7. 067	6. 067	
Ct	11	11	16	
Tr	20, 21	20, 20	17, 25	

Holotype ♀, INDEFATIGABLE : above Bella Vista, "poma rosa", 24.III. Allotype ♂, CHATHAM: 360 m, Progreso, *Psidium guajava*, 28.II. Paratype ♀♀, same data as allotype ♂, also HOOD: E., pools, *Cordia lutea*, 13.III. ALBEMARLE: Volcan Alcedo, 610 m, *Pisonia floribunda*, 1.V. Paratype ♂, HOOD: E., pools, *Cordia lutea*, 13.III. Other specimens, ALBEMARLE: Sierra Negra, 180 m, *Psidium guajava*, *Achras sapota*, 29.IV. JAMES: 580 m, dead tree lying on ground, 390 m, *Persea gratissima*, 20.IV. INDEFATIGABLE: 15-30 m, *Acacia* with lichen and *Pleurococcus*, 2.III. CHARLES: plateau, *Psidium guajava*, Citrus sp., 15.III. HOOD: E., pools, *Acacia*, 13.III. Holotype BISHOP 9915.

This species has a strong resemblance in wing pigmentation to species of *Haplophallus*, especially in the pterostigma, which has a brown edging of pigment with a hyaline center. Fore wing vein setae are not sited on dark spots as they are in typical *Aaroniella* species. Other structures such as the subgenital plate, phallosome and antenna are

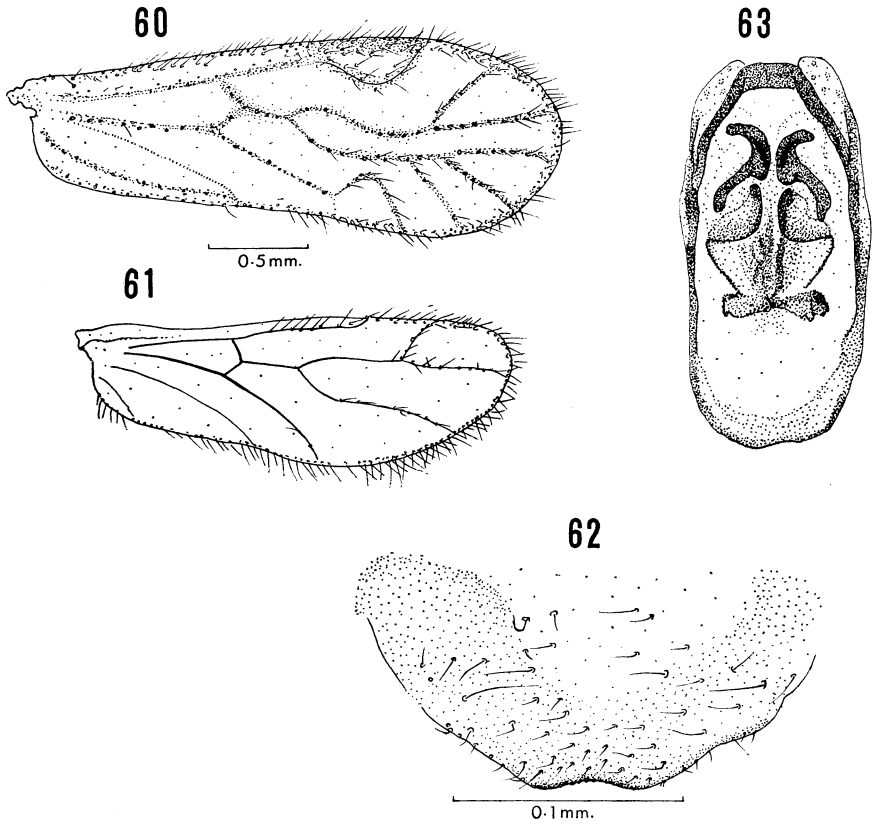

Fig. 60–63. *Aaroniella galapagensis* n. sp. ♂: 60, fore wing; 61, hind wing; 62, hypandrium; 63, phallosome. Figures 62 and 63 to common scale.

Aaroniella-like (Thornton, 1959). This species differs notably from all previously described species in the complex accessory sclerotization of the phallosome, lack of pigment in the fore wing, head pattern, and gonapophyses.

Family PSOCIDAE

Blaste uncinata Thornton & Woo, new species Fig. 64–71.

♀. *Coloration:* Head generally pale. Epicranial suture distinct. A brown median band extends from vertex through frons to clypeus, fading towards anterior margin of clypeus. Ocelli pale with black inner borders. Ocellar interval brown. Clypeus with faint parallel marks. Gena pale, with small brown post-orbital spot. Maxillarypalp pale, apical segment brown. Antenna with scape and pedicel light brown, flagellum brown. Mesothorax and metathorax with antedorsa brown, posterior margins cream, dorsal lobes brown with narrow cream area near posterior edge, posterior sutures brown, scutellum cream. Episternum brown. Legs with coxa brown; trochanter pale; femur pale, distal end light brown; tarsus brown. Fore wing (Fig. 64) hyaline, all veins distinct except cu_2, distal part of *rs* and anterior part of cu_1. Pterostigma slightly yellowish, r_1 dark brown. Hind wind (Fig. 65) hyaline, veins distinctly

brown. Abdomen pale, with transverse brown bands; dorsally with two additional brown patches and a more posterior T-shaped mark.

Morphology: Head covered with short fine hairs. In fore wing, pterostigma smoothly rounded at vertex, *rs* and *m* fuse for a distance, discoidal Scell widens anteriorly. Subgenital plate (Fig. 66) with setose apical lobe rounded apically, a broad V-shaped sclerotization. Gonapophyses (Fig. 67) with ventral valve thin, distal end curved outward and covered by long setae, ending in a pointed apex; dorsal valve broad and slightly twisted with a longitudinal sclerotized supporting rod; outer valve with large posterior lobe. Spermapore plate as in Fig. 68.

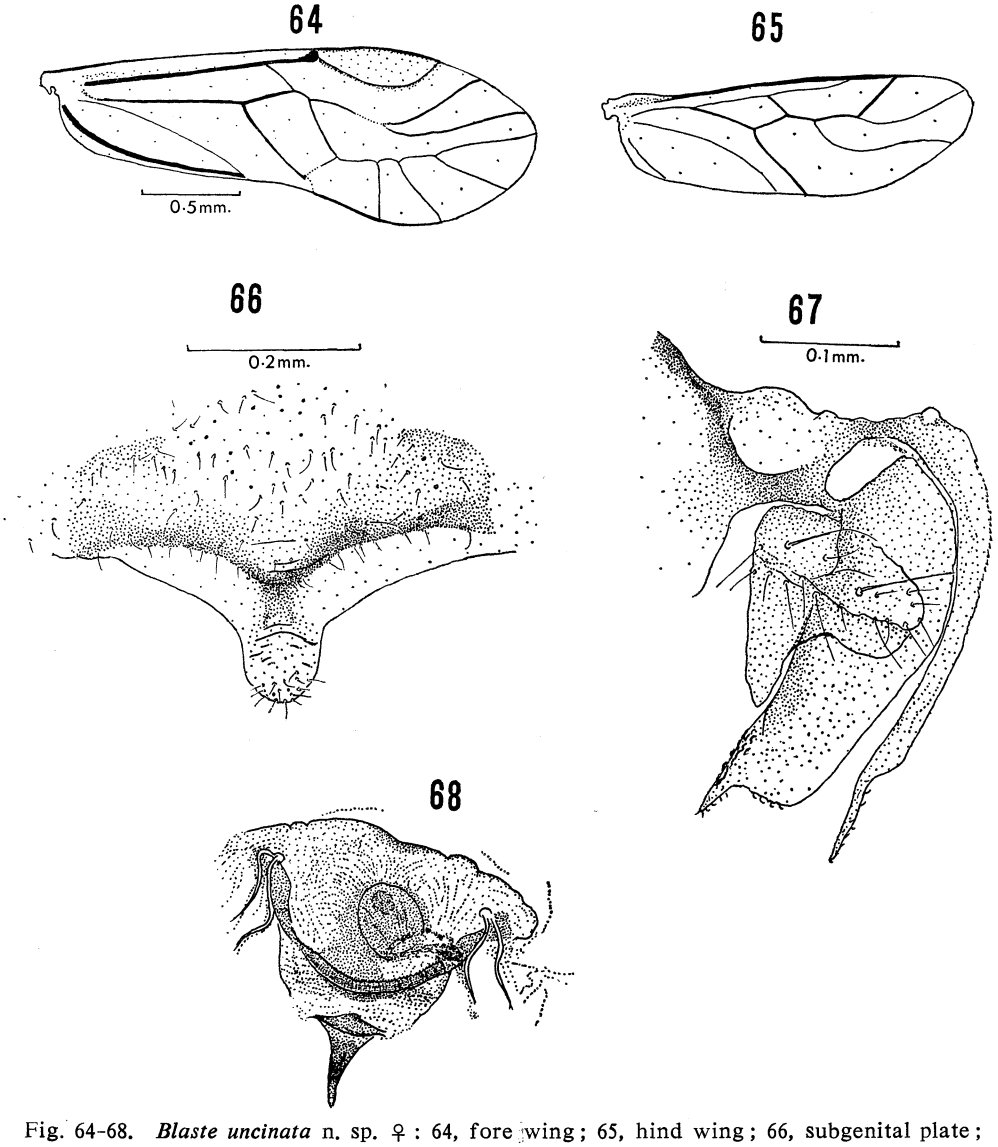

Fig. 64-68. *Blaste uncinata* n. sp. ♀ : 64, fore wing; 65, hind wing; 66, subgenital plate; 67, gonapophyses; 68, spermapore plate. Figures 67 and 68 to common scale.

♂. *Coloration:* As ♀ except postorbital spot and abdominal pattern faint and pale.

Morphology: Hypandrium (Fig. 69) highly asymmetrical and complex, consisting of 4 stout pointed teeth (one having a sclerotized lobose appendage, the 2 lateral ones each with a smaller tooth branching from it basally), an apparently free, curved sclerite, a rounded structure covered with small teeth, and a rounded setose structure. Phallosome (Fig. 70) with 2 slender parameres joined basally by a thin membrane, free ends terminating in curved hooks. Ninth tergite sclerotized heavily on posterior margin. Epiproct (Fig. 71) with posterior wavy margin lined with setae, a deep dorsal median indentation on the anterior margin. Paraproct with hook at distal end.

Table 9. Metric and meristic characters of *Blaste uncinata* n. sp. (lengths in mm; individual specimens represented by numbers)

Female	1	2	3	4	5
f_1	0.320	0.320	0.340	0.380	0.380
f_2	—	0.260	0.280	0.300	0.280
$f_1 : f_2$	—	1.231	1.214	1.267	1.357
I.O. : D	0.438	0.438	0.533	0.500	0.500
Fw	2.303	2.303	2.333	2.454	2.454
Hw	1.697	1.697	1.757	1.879	1.848
Hf	0.515	0.485	0.485	0.545	0.515
Ht	0.879	0.879	0.909	0.970	0.970
t_1	0.303	0.242	0.242	0.273	0.303
t_2	0.061	0.091	0.091	0.091	0.091
$t_1 : t_2$	4.967	2.659	2.659	3.000	3.333
Ct	16	14	15	15	18
Male	1	2	3	4	
f_1	0.400	0.380	0.400	0.420	
f_2	0.320	0.280	0.340	0.300	
$f_1 : f_2$	1.250	1.357	1.176	1.400	
I.O. : D	0.667	0.727	0.727	0.667	
Fw	2.212	2.212	2.273	2.333	
Hw	1.667	1.606	1.697	1.757	
Hf	0.455	0.424	0.455	0.455	
Ht	0.848	0.848	0.879	0.909	
t_1	0.242	0.242	0.273	0.273	
t_2	0.091	0.091	0.091	0.091	
$t_1 : t_2$	2.659	2.659	3.000	3.000	
Ct	16	17	16	18	

Holotype ♀, NORTH SEYMOUR: 15 m, *Maytenus obovata*, 3.III. Allotype ♂, data as holotype. Paratypes, INDEFATIGABLE: Academy Bay, *Maytenus obovata*, *Croton scouleri*, 7.IV. Other specimens, ALBEMARLE: Tagus Cove, *Castela galapagea* with encrusting lichen, *Cordia lutea* dead stump with lichen, *Croton scouleri*, 29.III; Sierra

Negra, 200 m, "tilo" (Mountain Ash), 29.IV. JAMES: 255 m, *Psychotria rufipes*, 19.IV; James Bay, dead wood, 20.IV. NORTH SEYMOUR: 15 m, *Bursera malacophylla*, *Opuntia*, 3.III; *Maytenus obovata*, 7.IV. INDEFATIGABLE: 15–30 m, Academy Bay, *Acacia*, 2.III. South Plaza: 15 m, *Maytenus obovata*, 7.III. CHARLES: Black Beach, *Prosopis* sp. and *Clerodendron molle*, 5.V. Holotype BISHOP 9916.

The extremely complex and highly asymmetrical hypandrium is quite unlike those of any of the genera or subgenera of the *Blaste-Euclismia* complex (see Badonnel, 1955, 1967a; Thornton, 1960). Whilst clearly a member of this complex, *B. uncinata* may represent a new species group. Until other related species are discovered, possibly from S. America (?), it seems prudent to leave *uncinata* in *Blaste* s. l., and to regard this as a "holding genus."

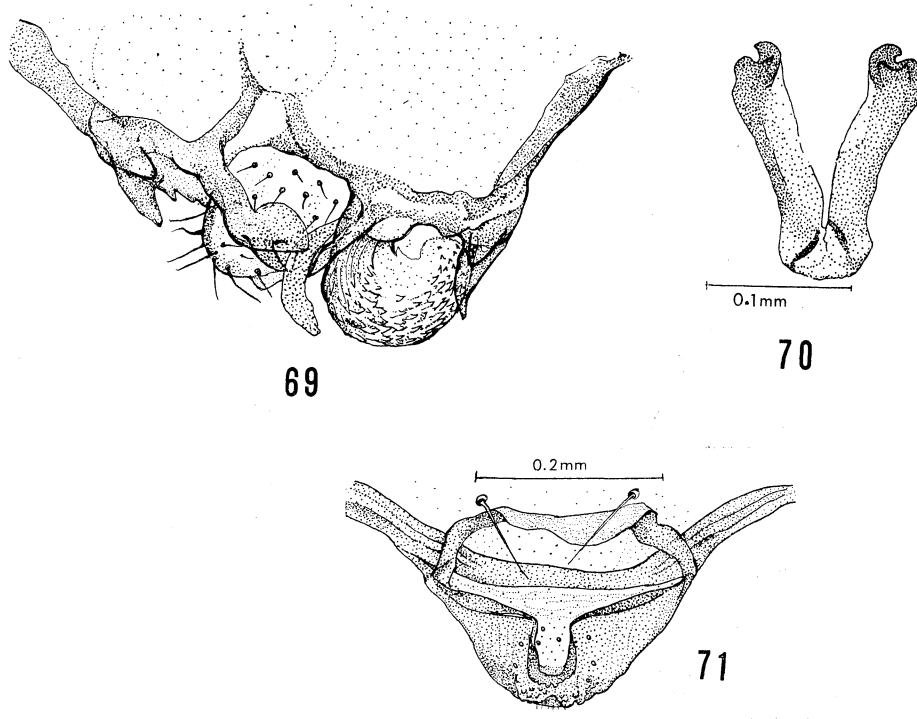

Fig. 69–71. *Blaste uncinata* n. sp. ♂: 69, hypandrium; 70, phallosome; 71, epiproct. Figures 69 and 71 to common scale.

Ptycta acraea Thornton & Woo, new species Fig. 72–76.

♀. *Coloration:* Head light brown with dark brown markings. Vertex with usual markings. Epicranial suture black. Ocelli pale, protuberance brown. Frons with stirrup-shaped median mark and a spot each side of this. A narrow brown stripe between eye and antennal socket. Gena with brown spot near posterior margin. Clypeus with usual parallel stripes, often uniting to form a diamond-shaped mark. Antenna with scape and pedicel brown, f_1 pale becoming brown in apical 1/3, remainder of flagellum brown. Maxillary palp brown except apical por-

tion of basal segment and basal portion of 3rd segment pale. Mesothorax with antedorsum brown, posterior apex darker brown bordered pale cream. Dorsal lobes brown with median and posterior cream areas, sutures brown. Scutellum dark brown with 2 circular pale areas laterally. Metathorax similar to mesothorax except for a cream stripe which bisects each dorsal lobe. Legs: coxa brown; trochanter clear, sometimes with a brown patch; femur brown, pigment usually in patches; tibia light brown, slightly darker apically; tarsus brown. Wing pattern as in Fig. 72. Abdomen pale with transverse grayish brown parallel bands. Ninth tergite brown.

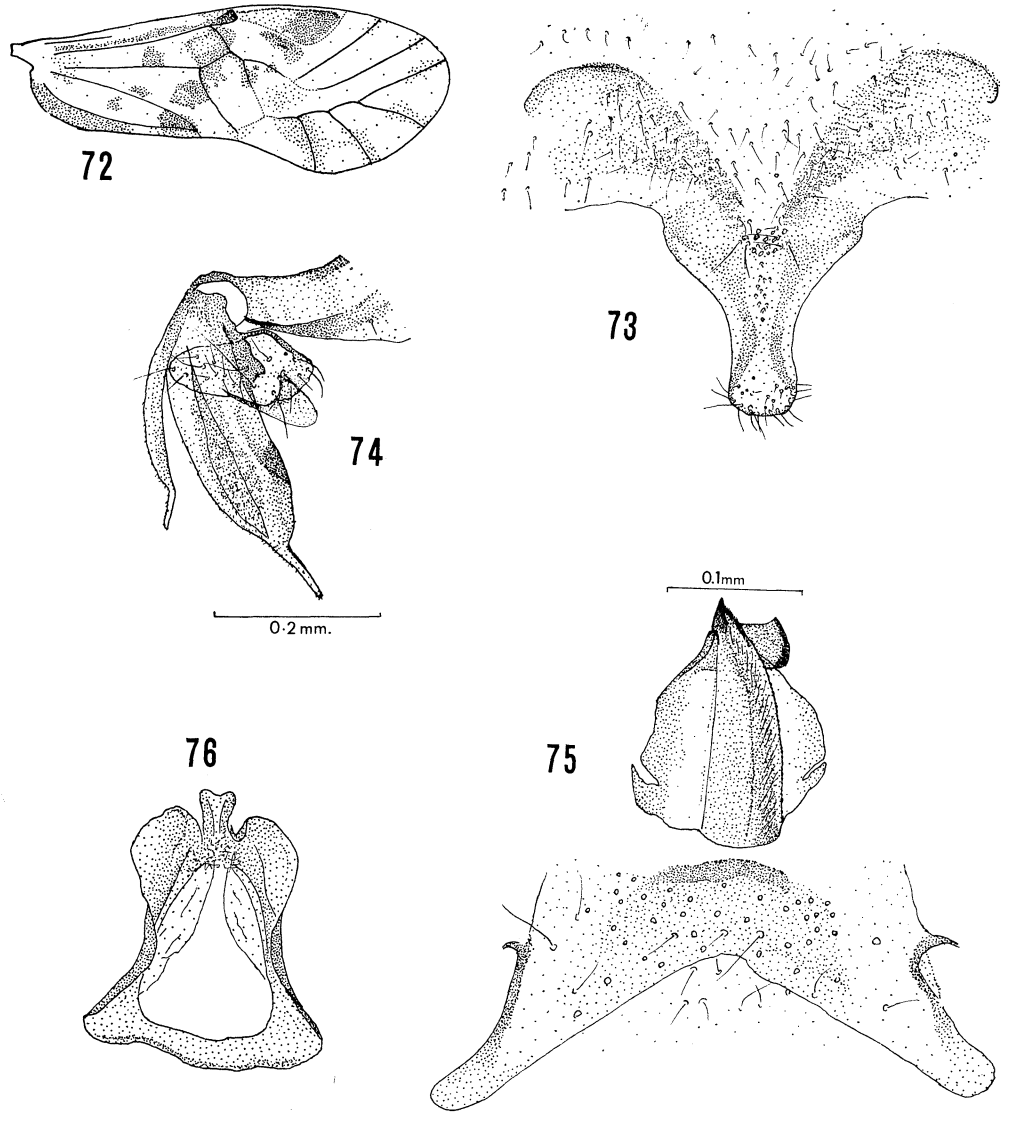

Fig. 72–76. *Ptycta acraea* n. sp. ♀ : 72, fore wing; 73, subgenital plate; 74, gonapophyses. ♂ : 75, hypandrium (broken); 76, phallosome. Figures 73, 74 and 76 to common scale; figure 72 to same scale as figure 83.

Morphology: Head and body finely haired. Subgenital plate (Fig. 73) with posterior lobe rounded, sclerotized laterally, median region pale and without setae, apex with a row of long setae, a few shorter and thinner setae more posteriorly. Anteriorly, posterior lobe widens and there is a median group of stout setae and a few short setae. Remainder of plate consists of 2 wedge-shaped areas. Gonapophyses (Fig. 74) with ventral valve styliform, apex pointed, posterior portion covered with spinelets; dorsal valve lobate with a median tract of spinelets, heavily sclerotized at dorsal edge, some sculpturing in the posterior 1/2 of the lobe; outer valve bearing long stout setae and a rounded fairly large posterior lobe. Epiproct sclerotized at posterior margin.

♂. *Coloration:* Similar to ♀ except for larger lateral frons marks, less pigment in fore wing and indistinct band between eye and antennal socket.

Morphology: Eyes much larger than in ♀. Clypeus smaller. Hypandrium (Fig. 75) (broken, from Duncan paratype) asymmetrical with an apical lobe curved spirally at apex, one side of

Table 10. Metric and meristic characters of *Ptycta acraea* n. sp. (lengths in mm; individual specimens represented by numbers)

Female	1	2	3	4	5
f_1	0.584	0.550	0.550	0.543	0.590
f_2	0.450	0.440	0.430	0.394	0.480
$f_1 : f_2$	1.297	1.250	1.279	1.378	1.229
I. O. : D	1.667	1.636	1.818	2.000	1.771
Fw	3.450	3.230	3.340	3.318	3.568
Hw	2.630	2.050	2.530	2.495	1.447
Hf	0.630	0.590	0.617	0.575	0.673
Ht	1.370	1.300	1.372	1.215	1.476
t_1	0.450	0.425	0.350	0.371	0.464
t_2	0.130	0.140	0.140	0.125	0.130
$t_1 : t_2$	3.462	3.036	2.500	2.968	3.569
Ct	19	18	20	20	18
Tr	19	16	15	20	17
Male	1	2	3	4	5
f_1	0.755	0.680	0.714	0.720	0.710
f_2	0.560	0.505	0.570	0.570	0.580
$f_1 : f_2$	1.348	1.346	1.252	1.263	1.224
I. O. : D	0.929	0.933	1.072	1.143	1.000
Fw	3.521	3.540	3.639	3.700	3.590
Hw	2.725	2.730	2.790	2.740	2.670
Hf	0.670	0.626	0.620	0.570	0.680
Ht	1.490	1.372	1.440	1.400	1.450
t_1	0.430	0.420	0.450	0.450	0.436
t_2	0.153	0.138	0.131	0.123	0.126
$t_1 : t_2$	2.810	3.043	3.435	3.658	3.460
Ct	20	20	20	21	20
	29	27	27	24	27

lobe with a ridge and more heavily sclerotized than the other. Phallosome (Fig. 76) bearing posteriorly a short rectangular median lobe bifid at posterior margin, and 2 round lateral lobes, thickness of frame almost uniform except for slightly thickening at anterior corners. Paraproct with posterior prong. Epiproct not sclerotized at posterior margin.

Nymph. Distinguishable from nymphs of the other *Ptycta* species in that the clypeus postsesses a fairly wide median dark band.

Holotype ♀, ALBEMARLE: Cerro Azul, 1300 m, *Psidium galapagea*, 26.IV. Allotype ♂, same data as holotype. Paratypes, ALBEMARLE: Volcan Darwin, W. slope, 500–800 m, *Dodonaea viscosa*, crater rim *c.* 1210 m, *Zanthoxylum fagara* with lichen, 1250 m, *Zanthoxylum fagara*, *c.* 1210 m, crater platform *Croton scouleri*, *Lippia rosemarinifolia*, *Scalesia microcephala*, 28–29.III; Volcan Alcedo, 610 m, *Pisonia floribunda*, 1.V; 1000 m, crater rim, *Zanthoxylum fagara*, 1.V; Sierra Negra, 360–970 m, *Psidium guajava*, *Zanthoxylum fagara*, 28.IV; Cerro Azul, 970–1570 m, dead tree with lichen, *Psidium galapagea*, *Zanthoxylum fagara*, *Scalesia*, *Cordia galapagensis*, *Croton scouleri*, *Maytenus obovata*, 26.IV. JAMES: 255 m, *Psychotria rufipes*, 390 m, *Persea gratissima*, 490 m, water drip, 580 m, *Pisonia floribunda*, dead tree with lichen, 610 m, *Pisonia floribunda*, 820 m, *Pisonia floribunda*, *Zanthoxylum fagara*, 19–20.IV. DUNCAN: summit and upper caldera areas, 7.II. 1964, D. Q. Cavagnaro. INDEFATIGABLE: 550 m, *Miconia*, 5.IV. CHARLES: plateau, *Mangifera indica*, 15.III. CHATHAM: 360 m, Progreso, *Psidium guajava*, 28.II. Holotype BISHOP 9917.

P. acraea is restricted to high islands of the archipelago; it is a highland form, occurring from about 500 m to 1500 m above sea level. It probably also occurs on Narborough, but only two days could be spent on the Narborough volcano, and psocids at high altitudes were not well sampled on this island.

Ptycta dentata Thornton & Woo, new species Fig. 77–82.

♀. *Coloration:* Head pale cream with brown markings. Vertex with usual marks. Ocelli pale, inner borders black. Frons with a median inverted U-shaped mark and 2 lateral stripes sometimes fusing with median mark. A thin streak between antennal socket and eye. Clypeus pale with usual parallel stripes, often darkening to form a transverse band 1/2 way down clypeus. Gena pale with a post-orbital spot. Labrum light brown. Antenna with scape and pedicel pale, f_1 pale, darkening towards the apex, f_2 and successive segments completely brown. Maxillary palp with basal 3 segments pale, apical segment light brown gradually becoming brown at apex. Mesothorax with antedorsum brown, posterior border cream, sutures brown, dorsal lobes brown. Scutellum light brown. Sterna brown. Metathorax similar to mesothorax except for a pale area in middle of each dorsal lobe, scutellum dark brown. Wing pattern as in Fig. 77. Legs: coxa brown; trochanter pale; femur pale with a dorsal light brown spot near distal end; tibia pale; tarsus brown. Abdomen without longitudinal bands.

Morphology: Head finely pubescent. Subgenital plate (Fig. 78) with a long apical lobe well sclerotized laterally and with a median less sclerotized area covered with short setae; apex of lobe rounded with marginal stout setae. Gonapophyses (Fig. 79) with ventral valve styliform, terminating in a pointed apex, with a row of fine spinelets along posterior portion of ventral edge; dorsal valve long with heavily sclerotized bar along dorsal edge, terminating in a pointed apex covered with spinelets; outer valve setose with a small posterior lobe.

♂. *Coloration:* Pigment usually darker than in ♀. Lateral frons mark faint. Region between eye and antennal socket brown.

Morphology: Hypandrium (Fig. 80 and 81) with 2 apical lobes covered with teeth. Anterior

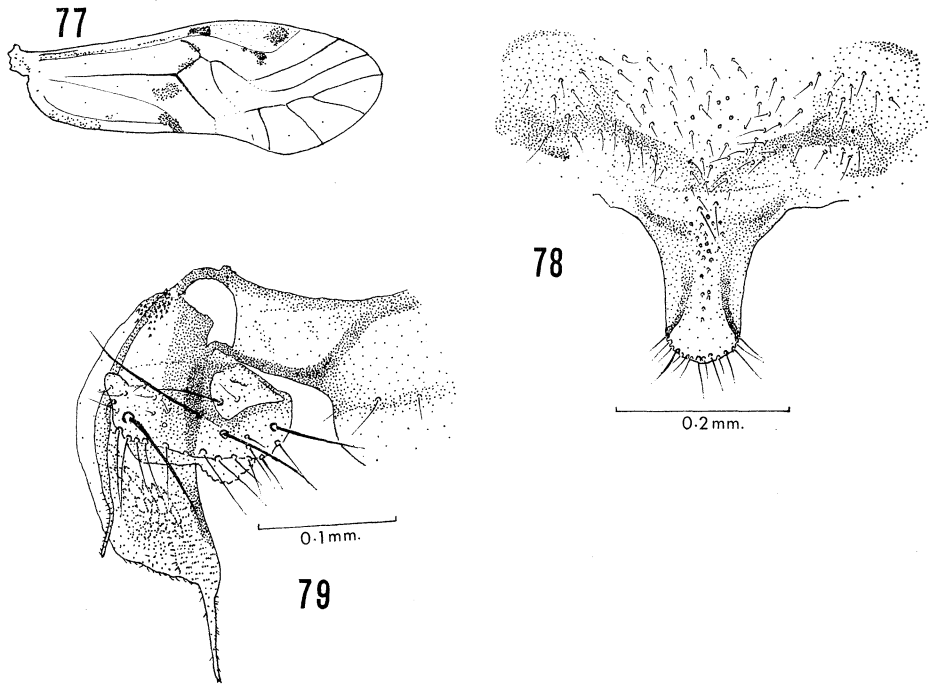

Fig. 77-79. *Ptycta dentata* n. sp. ♀ : 77, fore wing; 78, subgenital plate; 79, gonapophyses. Figure 77 to same scale as figure 83.

to these, a V-shaped flap with fairly long setae more numerous medially than laterally. Phallosome (Fig. 82) with 5 posterior apophyses and an area of teeth posterolaterally at each side. Epiproct U-shaped, sclerotized heavily near attachment to 9th tergite. Paraproct with curved prong.

Holotype ♀, JAMES : Buccaneer Bay, *Castela galapagea* with encrusting lichen, 12. VI. Allotype ♂, CHATHAM: base of Cerro Brujo, *Maytenus obovata*, 28.V. Paratypes, NARBOROUGH: crater island, *Lippia rosemariniflora*, *Cassia picta*, 24-25.III; Punta Espinosa, *Rhizophora mangle*, *Avicennia nitida*, *Laguncularia racemosa*, 27.III. ALBEMARLE: Volcan Darwin, W. slope, 500-800 m, *Dodonaea viscosa*, just below rim, crater platform, 1180 m, *Dodonaea viscosa*, 28-29.III: Tagus Cove, *Castela galapagea*, with encrusting lichen, dead stump, *Cordia lutea* with lichen patches, *Croton scouleri*, 29.III; Volcan Alcedo, 460 m, *Zanthoxylum fagara* with lichen, (nymph) 1.V; Sierra Negra, shore, *Annona* sp., (nymphs), 30.IV; Volcan Wolf, 1600 m, 20.V; Cerro Azul, 970 m, dead tree with lichen, 1300 m, *Psidium galapagea*, *Zanthoxylum fagara*, 1380 m, *Zanthoxylum fagara*, 26.IV. BRATTLE: 60-90 m, *Periloba galapagensis*, 31.III. ABINGDON: 360 m, *Croton scouleri*, 18.V (nymph). JAMES: 255 m, *Psychotria rufipes*, 19.IV; James Bay, dead wood, 390 m, *Persea gratissima*, 20.IV. JERVIS: lagoon, *Maytenus obovata* and dead fungi, 21.IV. DUNCAN: shore, *Croton scouleri*, 21.IV; summit and upper caldera areas, 2.II.1964, D. Q. Cavagnaro. BINDLOE: crater, 45 m, and S. beach, *Cordia lutea*, 16.V. NORTH SEYMOUR: 15 m, *Maytenus obovata*, 3.III, same data, 7.IV. INDEFATIGABLE: 15 m, Academy Bay,

Table 11. Metric and meristic characters of *Ptycta dentata* n. sp. (lengths in mm ; individual specimens represented by numbers)

Female	1	2	3
f_1	0. 555	0. 637	0. 585
f_2	0. 424	0. 445	0. 467
$f_1 : f_2$.	1. 309	1. 431	1. 253
I. O. : D	1. 563	1. 700	1. 777
Fw	2. 570	2. 757	2. 695
Hw	1. 943	1. 970	2. 085
Hf	0. 520	0. 570	0. 570
Ht	1. 068	1. 206	1. 148
t_1	0. 349	0. 406	0. 375
t_2	0. 095	0. 134	0. 121
$t_1 : t_2$	3. 674	3. 029	3. 099
Ct	21	22	19
Tr	15	19	17
Male	1	2	
f_1	0. 570	0. 576	
f_2	0. 350	0. 460	
$f_1 : f_2$	1. 628	1. 252	
I. O. : D	0. 714	0. 833	
Fw	2. 445	2. 485	
Hw	1. 970	1. 885	
Hf	0. 530	0. 478	
Ht	1. 180	1. 800	
t_1	0. 356	0. 378	
t_2	0. 139	0. 123	
$t_1 : t_2$	2. 561	3. 073	
Ct	23	24	
Tr	19	15	

Acacia, 2.III ; Academy Bay, *Maytenus obovata*, *Croton scouleri*, 7.IV ; Academy Bay, 23.I, 20.II.1964, 10.V.1964, R. O. Schuster and D. Q. Cavagnaro. CHARLES : plateau, *Mangifera indica*, *Psidium guajava*, *Citrus* sp., *Persea gratissima*, "poma rosa", 15.III ; Black Beach, *Prosopis* sp. and *Clerodendron molle*, 5, 7.V ; 340 m, *Scalesia*, 6.V. TOWER : 15 m, crater lake, mangrove, *Bursera malacophylla* and *Cordia lutea*, 8.III ; shore, *Bursera malacophylla*, *Croton*, 8.III. BARRINGTON : 60 m, W. end, *Cordia lutea*, 13.V ; 150 m, central plateau, *Cordia lutea*, 13.V. CHATHAM. ; 460 m, 1 km S of EI Junco, *Psidium guajava* with lichen and moss, 11.IV : near shore, Wreck Bay, *Scutia spicata*, *Croton scouleri*, 13.IV ; base of Cerro Pitt, *Scutia spicata* and dead twigs, *Cordia lutea*, 26.V ; Sappho Cove, dead twigs, 27.V ; base of Cerro Brujo, *Maytenus obovata*, *Cryptocarpus* and *Roccella*, 28.V. HOOD : Gardner-By-Hood, 15 m, *Bursera malacophylla*, *Cordia lutea*, *Croton*, *Acacia*, 13.III ; E., pools, *Cordia lutea*, *Acacia*, 13.III ; SW, 110 m, *Acacia*, *Cordia lutea*, 14.III. Holotype BISHOP 9918.

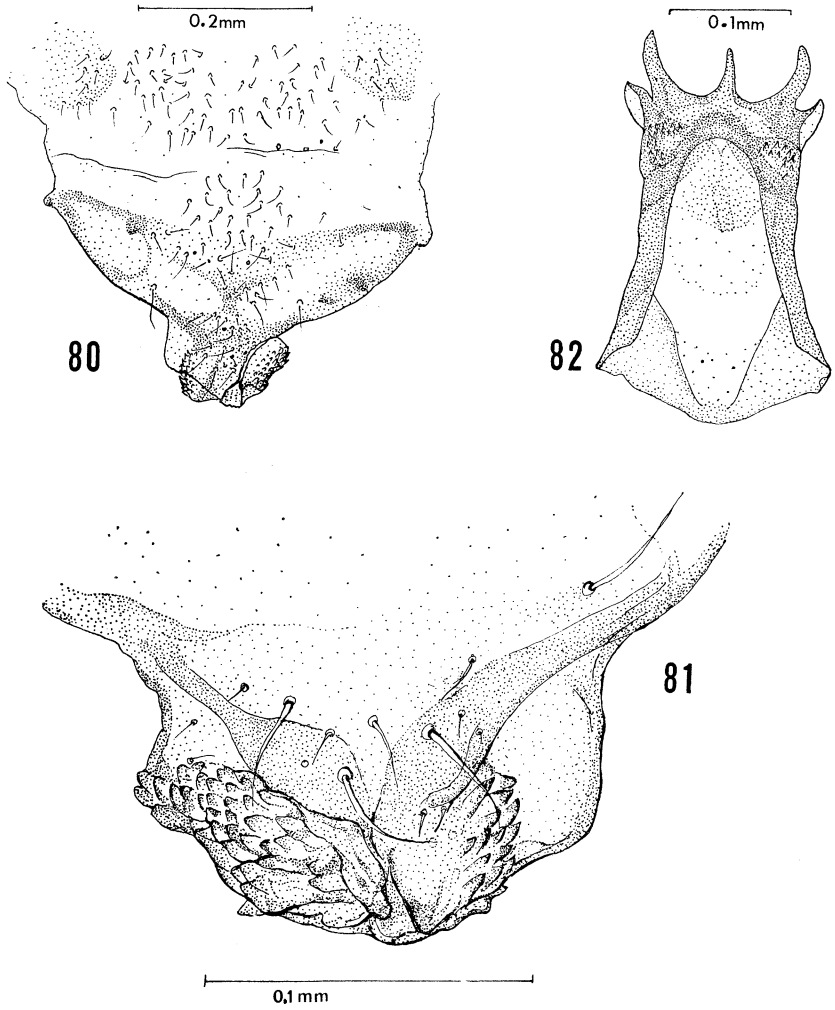

Fig. 80-82. *Ptycta dentata* n. sp. ♂: 80, hypandrium; 81, enlargment of hypandrial apex; 82, phallosome.

This species is closely related to *Ptycta acraea* but can be distinguished from it particularly by the toothed apical lobe of the hypandrium, the shape of the phallosome and the less pigmented wing pattern. *P. dentata* occurs at both high and low elevations. It is also more widespread than *P. acraea*, occurring on all islands except the far northwestern islands, Culpepper and Wenman. A nymph only was found on Abingdon.

Ptycta marta Thornton & Woo, new species Fig. 83-90.

♀. *Coloration:* Head generally buff with brown markings. Vertex with usual marks. Ocelli pale, inner borders black. Frons-vertex suture distinct. Frons with central stirrup mark and lateral stripes. Clypeus with usual parallel stripes. Labrum light brown. Gena white with a

curved L-shaped mark. Antenna with scape and pedicel pale, f_1 pale becoming progressively brown, f_2 and successive segments brown. Maxillary palp pale with apex of distal segment brown. Mesothorax with antedorsum pale, dorsal lobes pale anteriorly, gradually becoming brown posteriorly, scutellum light brown laterally with pale central area. Metathorax similar but much darker than mesothorax, dorsal lobes dark brown anteriorly, brown posteriorly. Episterna and sterna brown. Legs: coxa brown; trochanter and tibia pale; femur pale with a subdistal spot; tarsus brown, t_2 darker than t_1. Pigmentation of fore wing as in Fig. 83. Abdomen pale with 1 median brown band and 2 to 3 lateral bands on each side.

Morphology: Head and body finely pubescent. Subgenital plate (Fig. 84) with a wide apical lobe having posterior margin covered with stout long setae, median region of lobe with very fine setae. Anteriorly, 2 wedge-shaped setose lateral plates joined to form a V-shaped pattern, heavily sclerotized at the junction. Gonapophyses (Fig. 85) with ventral valve apex pointed with a row of recurved setae on ventral edge; dorsal valve long, terminating in a pointed apex and with a longitudinal tract of spinelets medially; outer valve large, with a small posterior lobe. Spermapore plate as in Fig. 86. Epiproct and paraproct as in Fig. 87.

♂. *Coloration:* Similar to that of ♀, but usually more intense.

Morphology: Antenna slightly thicker than that of ♀. Hypandrium (Fig. 88) symmetrical,

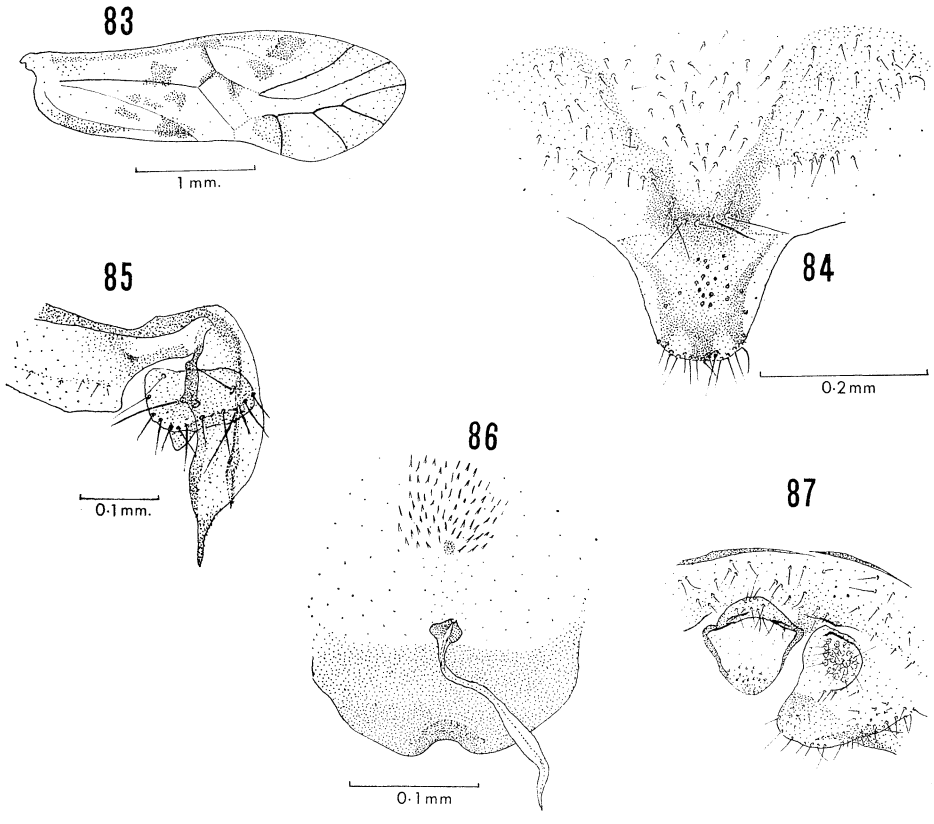

Fig. 83-87. *Ptycta marta* n. sp. ♀: 83, fore wing; 84, subgenital plate; 85, gonapophyses; 86, spermapore plate; 87, epiproct and paraproct. Figures 84 and 87 to common scale.

apical lobe long and bent inwards with slightly indented apex and heavily sclerotized edges lined with teeth, width of teeth increasing basally. Phallosome (Fig. 89) a closed, diamond-shaped frame with short lateral apophyses and a long pointed apical projection. Epiproct (Fig. 90) heavily sclerotized all round, thicker anteriorly and with a group of spinelets, posterior part with a group of long and short setae. Paraproct (Fig. 90) with a small sclerotized projection at region of fusion to 9th tergite.

Nymph. Clypeus pale, fairly uniform. Abdomen with 3 very narrow longitudinal bands, one medially, one each side extremely laterally.

Table 12. Metric and meristic characters of *Ptycta marta* n. sp. (lengths in mm; individual specimens represented by numbers)

Female	1	2	3	4	5
f_1	0.557	0.566	0.560	0.527	0.515
f_2	0.495	0.470	0.450	0.452	0.450
$f_1 : f_2$	1.125	1.204	1.244	1.166	1.144
I. O. : D	1.800	2.000	1.800	1.800	1.500
Fw	2.862	2.856	2.939	2.740	2.710
Hw	2.250	2.204	2.190	2.237	2.110
Hf	0.619	0.590	0.615	0.590	0.546
Ht	1.260	1.178	1.273	1.198	1.163
t_1	0.420	0.386	0.413	0.378	0.400
t_2	0.126	0.115	0.120	0.123	0.122
$t_1 : t_2$	3.333	3.357	3.442	3.073	3.279
Ct	21	19	22	19	20
Tr	26	26	24	28	26
Male	1	2	3	4	5
f_1	0.638	0.628	0.615	0.698	0.630
f_2	0.495	0.517	0.298	0.582	0.518
$f_1 : f_2$	1.289	1.215	2.064	1.199	1.216
I. O. : D	0.929	1.166	0.857	0.750	0.857
Fw	2.730	2.696	2.684	2.960	2.739
Hw	2.108	2.270	1.988	2.207	2.333
Hf	0.570	0.593	0.568	0.634	0.610
Ht	1.285	1.280	1.229	1.385	1.308
t_1	0.444	0.465	0.436	0.401	0.496
t_2	0.115	0.120	0.130	0.125	0.110
$t_1 : t_2$	3.861	3.875	3.354	3.688	4.055
Ct	20	23	24	22	23
Tr	29	27	32	32	33

Holotype ♀, WENMAN: W. cliff, 230 m, *Scalesia*, 9.VI. Allotype ♂, same data as holotype. Paratypes, WENMAN: NW, 55 m, Booby plateau, *Croton*, 10.VI. INDEFATIGABLE: Academy Bay, 28.I.1964, R. O. Schuster. CHARLES: Black Beach, *Prosopis* sp., 7.V. CHATHAM: Base of Cerro Brujo, dead *Cordia* and *Roccella*, 28.V. Holotype BISHOP 9919.

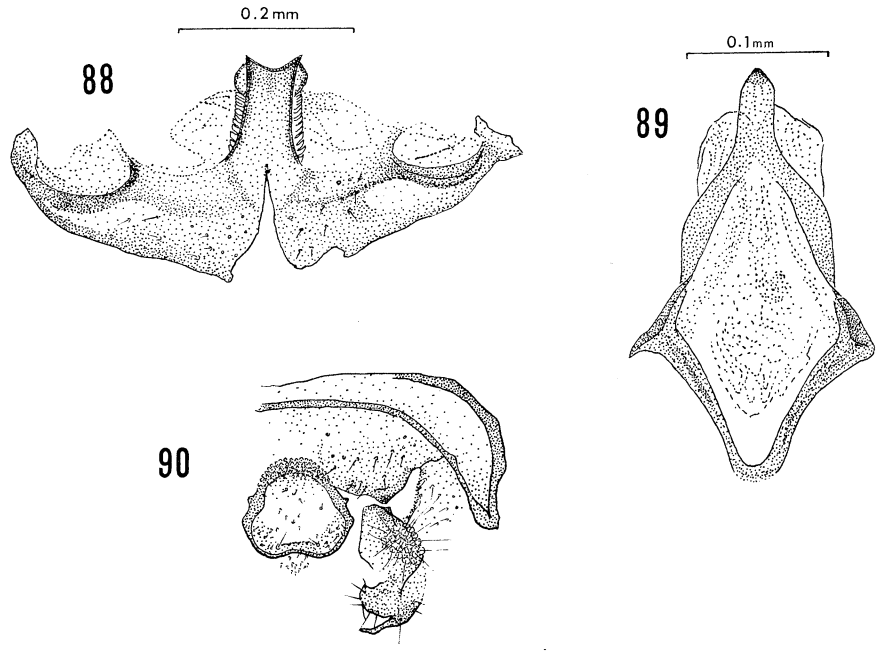

Fig. 88-90. *Ptycta marta* n. sp. ♂ : 88, hypandrium; 89, phallosome; 90, epiproct and paraproct. Figures 88 and 90 to common scale.

This species is easily distinguished from the two previous species on wing pattern and genitalic features. *P. marta* has an unusual distribution, occurring on the southeastern islands Indefatigable, Chatham and Charles, as well as on the extreme northwestern island, Wenman. A closely similar form was collected from Santa Elena on the coast of Ecuador. In all three *Ptycta* species, there is evidence of the differentiation of island populations on the archipelago. This will be discussed elsewhere.

New (1972c) has described the described the females of four *Ptycta* species from the Mato Grosso of Brazil. Two of these species, *P. reticulata* and *P. sinuatistigma* are clearly distinct from the Galapagos species on wing pattern, and the Galapagos species, *P. marta* and *P. dentata* may be distinguished from the other two Brazilian species on characteristics of the subgenital plate and wing pattern respectively. *P. acraea* is separable from the Brazilian *P. lunulata* on setal pattern of the subgenital plate lobe, and from *P. pearmani* on details of wing pattern and structure of the subgenital plate and outer valve of the gonapophyses.

Family MYOPSOCIDAE

Myopsocus chelatus Thornton & Woo, new species Fig. 91-96.

♀. *Coloration:* Ground color of vertex yellowish, rest of head pale cream with dark brown markings. Vertex with usual marks, epicranial suture clear. A distinct thick dark brown band extending medially from frons to clypeus. Irregular purplish-brown patches and stripes on frons,

lateral to median band. On clypeus, median band is crossed by darker V-shaped lines, rest of clypeus clear. Gena brown with darker purplish brown patches, but clear around antennal socket. Labrum brown. Antenna with scape and pedicel pale, f_1 pale, distal 1/4 brown, extent of pigment increasing in f_2 and f_3, f_4 and successive segments completely brown. Ocelli brown with black inner borders. Maxillary palp brown, clear at joints. Mesothorax with antedorsum and dorsal lobes dark brown, scutellum pale except for 2 brown stripes and brown posterior margin. Metathorax pale except for a few faint purplish patches. Episternum with irregular brown and purplish brown patches. Sterna pale. Legs: coxa brown; trochanter clear; femur brown, distal end clear with dorsal brown spot and ventral brown stripe; tibia pale; 1st tarsal segment pale, brown at apex, t_2 and t_3 completely brown. Fore wing as that of ♂ (Fig. 91), mottled, veins with alternate light and dark sections, pterostigma purplish. Hind wing (Fig. 92) hyaline, veins brown, anterior margin of wing with light and dark areas. Abdomen pale cream with 1 median and 2 lateral bands.

Morphology: Head and body covered with short fine hairs. Anterior ocellus smaller than two

Table 13. Metric and meristic characters of *Myopsocus chelatus* n. sp. (lengths in mm; individual specimens represented by numbers)

Female	1	2	3	4	
f_1	0.667	0.848	0.788	0.848	
f_2	—	0.636	0.667	0.758	
$f_1 : f_2$	—	1.333	1.053	1.217	
I.O. : D	0.579	0.619	0.650	0.619	
Fw	3.091	4.000	3.788	3.909	
Hw	2.424	3.151	2.909	3.091	
Hf	0.788	1.000	0.970	0.788	
Ht	1.151	1.485	1.485	1.515	
t_1	0.424	0.455	0.515	0.485	
t_2	0.030	0.061	0.061	0.030	
$t_1 : t_2$	1.400	0.750	0.850	1.600	
Ct	18	20	19	20	
Tr	33, 35	29, 31	33, 34	—	
Male	1	2	3	4	5
f_1	1.182	0.939	0.909	0.788	0.758
f_2	0.697	0.758	0.758	0.667	—
$f_1 : f_2$	1.696	1.239	1.199	1.181	—
I.O. : D	1.417	1.417	1.231	1.417	1.250
Fw	3.333	3.454	3.727	3.151	2.969
Hw	2.545	2.666	2.879	2.515	2.303
Hf	0.788	0.909	0.970	0.818	0.788
Ht	1.364	1.394	1.212	1.212	1.151
t_1	0.485	0.545	0.515	0.424	0.394
t_2	0.030	0.061	0.061	0.061	0.061
$t_1 : t_2$	1.600	0.900	0.850	0.700	0.650
Ct	21	20	21	18	17
Tr	32	—	—	34	37

posterior ones. In fore wing *rs* and *m* joined by a short cross vein, areola postica fused with media for a short distance, anterior margin very sparsely haired. Subgenital plate (Fig. 93) with a posterior median lobe, heavily sclerotized at posterior margin and without setae. Gonapophyses (Fig. 94, paratype, Indefatigable) with ventral valve short, about 1/2 length of dorsal valve, sclerotized at dorsal edge and terminating in a blunt end with spinelets on ventral margin; dorsal valve long and pointed, sclerotized heavily at dorsal edge; outer valve ovoid, with 7 stout setae and numerous shorter ones. Epiproct simple, setose. Paraproct with 32 trichobothria.

♂. *Coloration:* As ♀ except less intense pigmentation of head and body, lateral frons mark faint, fore wing (Fig. 91) more densely mottled. Hind wing (Fig. 92), as ♀.

Morphology: Hypandrium (Fig. 95, paratype, Indefatigable) simple, with a round apex heavily sclerotized at posterior margin. Phallosome (Fig. 96) symmetrical, elongate, sclerotized at margin, posteriorly projected into a pincer-shaped structure with blunt, stout ends. Anterior to this a membraneous flap bearing a median groove with folds on both sides. Paraproct armed with a curved hook, posterior edge marked with scale-like sculpturing. Epiproct as that of ♀.

Holotype ♂, CHATHAM: 460m, 1 km S of El Junco, *Psidium guajava*, 11.IV. Allotype ♀, same data as holotype. Paratypes, CHATHAM: S of El Junco, 460 m, *Psidium guajava*, 460 m, 180 m E of El Junco, below and 1 km SE of El Junco, *Miconia*, 1 km S of EI Junco, 460 m, *Psidium guajava* with lichen and moss, 11.IV; near shore, *Croton scouleri*, 13.IV. CHARLES : plateau, *Mangifera indica*, "guanavano", *Psidium guajava*, *Citrus* sp., *Persea indica*, "poma rosa", 15.III. INDEFATIGABLE : Academy Bay, 12.II. 1964, D. Q. Cavagnaro and R. O. Schuster. Other specimens, ALBEMARLE : Volcan Wolf, 470 m, *Tournefortia rufosericea*, 20.V; Volcan Alcedo, 1000 m, crater rim, *Zanthoxylum fagara*, 610 m, *Pisonia floribunda*, 1.V; Sierra Negra, 960 m, *Psidium guajava* and lichen, 970 m, crater rim, *Zanthoxylum fagara*, 28.IV; 200 m, "tilo" (Mountain Ash), 180 m, *Psidium guajava*, *Achras sapota*, 29.IV; Cerro Azul, 150 m, dead twigs, 970 m, dead tree with lichen, 25.IV; 1420 m, *Zanthoxylum fagara*, 26.IV. JAMES: 355–640 m, *Hippomane mancinella*, *Zanthoxylum fagara*, *Psychotria rufipes*, 19.IV ; 170–610 m, *Croton scouleri*, *Pisonia floribunda*, *Persea gratissima*, dead overhanging ferns, 20. IV. INDEFATIGABLE: Bella Vista, *Persea gratissima*, "poma rosa", 24.III; Academy Bay, *Croton scouleri*, 5, 7.IV. BARRINGTON: 150 m, central plateau, *Cordia lutea*, 13.V; 60 m, *Bursera malacophylla*, 12.III. CHATHAM: 360 m, Progreso, *Psidium guajava*, 28.II; base of Cerro Pitt, *Scutia spicata*, *Scalesia incisa*, 26.V; Sappho Cove, *Maytenus obovata*, 27.V; base of Cerro Brujo, dead *Cordia* and *Roccella*, 28.V. HOOD: E., *Cordia lutea*, *Acacia*, 13.III; SW, 100 m, *Cordia lutea*, 14.III; Gardner-by-Hood, various shrubs, 13.III. Holotype BISHOP 9920.

This species differs from all other known *Myopsocus* species in wing pattern and phallosome structure.

DISTRIBUTION AND AFFINITIES

Of the 39 species recorded above, 19 are known from elsewhere and 20, so far as is presently known, are confined to the Galapagos.

The known species include seven which are widespread, particularly in the tropics, and possibly distributed through commerce. They are *Echmepteryx madagascariensis*, *Psoquilla marginepunctata*, *Liposcelis entomophilus*, *Ectopsocus meridionalis*, *Ectopsocus maindroni*, *Ectopsocus richardsi*, and *Pseudocaecilius criniger*. The remaining 12 known species

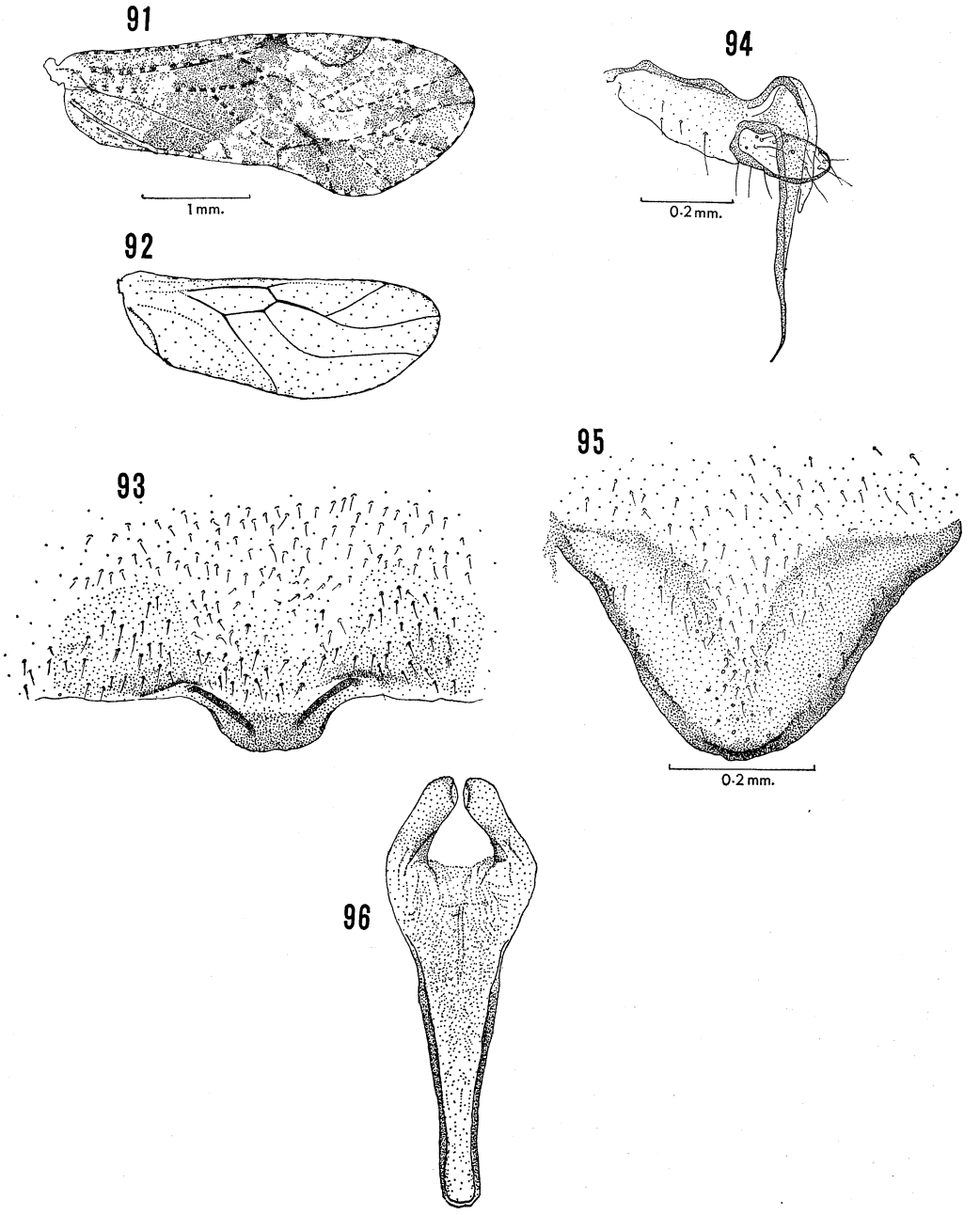

Fig. 91-96. *Myopsocus chelatus* n. sp. ♂ : 91, fore wing; 92, hind wing. ♀ : 93, subgenital plate; 94, gonapophyses. ♂ : 95, hypandrium; 96, phallosome. Figures 91 and 92, 93 and 94, 95 and 96 to common scales.

have distributions which are chiefly Pacific (*Echmepteryx lunulata*, *Lepidopsocus maculatus*, *Pseudocaecilius tahitiensis*, *Archipsocus spinosus*), South American (*Caecilius distinctus*) or from the Central America-Caribbean area (*Caecilius antillanus*, *Caecilius insularum*, *Lachesilla aethiopica*, *Peripsocus potosi*). *Embidopsocus pauliani* is known only from Africa and Madagascar, *Peripsocus pauliani* from Africa, SE Asia and Micronesia, and *Peripsocus stagnivagus* from North America.

The affinities of several of the newly described species are difficult to determine (species of *Nepticulomima*, *Embidopsocus*, *Aaroniella* and *Myopsocus*) and this may reflect lack of knowledge of the South American fauna. *Echmepteryx aperta*, *Soa reticulata*, the three *Cerobasis* species, *Epipsocus campanulatus*, and the *Ptycta* group are similar to South American species, and species of *Tapinella* and *Peripsocus* are similar to species with Pacific distributions. Other newly described species show similarities with species from North America (*Lachesilla castroi*) and Africa (*Pachytroctes achrosta*).

Table 14. The numbers of genera and species of Galapagos *Psocoptera*

Family	Genera	Species
Lepidopsocidae	4	5
Trogiidae	1	3
Psoquillidae	2	2
Liposcelidae	2	3
Pachytroctidae	2	3
Epipsocidae	1	1
Caeciliidae	1	3
Lachesillidae	1	2
Ectopsocidae	1	4
Peripsocidae	1	4
Pseudocaeciliidae	1	2
Archipsocidae	1	1
Philotarsidae	1	1
Psocidae	2	4
Myopsocidae	1	1
Total	22	39

Thus the psocopteran fauna as a whole may be said to have South and Central American, Pacific and North American affinities, with the first two being the most important.

The 39 species of Galapagos Psocoptera represent 22 genera and 15 families (Table 14). The average number of species per genus is 1.8, which is near that of continental islands and relatively low for oceanic archipelagos (Table 15). Of the 39 species, 22 are described for the first time.

The fact that the average number of species per genus is low for oceanic islands may not necessarily imply that speciation is not taking place, but rather that speciation has not yet proceeded to a stage at which daughter species are clearly recognizable. Evidence of differentiation in Galapagos island populations of *Ptycta* species will be presented separately elsewhere.

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Table 15. Psocoptera fauna of various islands and island groups

	Genera	Species	Average no. of species/genus
Great Britain	35	68	1.9
Taiwan	36	70	1.9
Hong Kong	40	91	2.3
Philippines	28	70	2.5
Japan	47	125	2.7
Galapagos	22	39	1.8
Micronesia	25	90	3.6
Madagascar	35	168	4.8*
Hawaiian Islands	23	258	11.2**

* Badonnel, *in litt.*

** This figure is 2.2 if only the non-endemic fauna is considered, and 72.0 if only the endemic fauna is considered.

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