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STUDIES ON THE REUTERELLINE PSOCIDS
(PSOCOPTERA)

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The subfamily Reuterellinae is discussed in only a single paper on Western Hemisphere psocids (Mockford, 1952), in which records of a single undetermined species of *Reuterella* are presented. Through examination of material from Florida and the West Indies, I have found four additional New World species, all of which are new; three of these I regard as representing a new genus. The addition of this genus necessitates some modification of the definition of the subfamily. It is the purpose of this paper to describe the new genus and species, to present life-history data for some of these (in part supplementing the morphological diagnoses), to present a key to the world species of Reuterellinae, to discuss the identity of the North American *Reuterella* referred to above, to re-define the subfamily and summarize evidence bearing on its taxonomic position, and to discuss the geographical distribution of the group.

KEY TO THE WORLD SPECIES OF REUTERELLINAE

1. Color pattern of dorsal surface of abdomen a conspicuous white cross against a brown background (Pearman, 1936, pl. I, fig. 7). Body bearing numerous stout, spiniferous setae. Males apterous *Nepiomorpha* 2
Color of dorsal surface of abdomen not at all as above, usually a single shade throughout membranous portions. Males of bisexual species winged 3
2. Head uniformly chestnut brown except for paler clypeus. Margin of subgenital plate with a distinct median process (Pearman, 1936, pl. I, fig. 12) and this bearing seven to nine stout setae. Inner valve of gonapophyses of ninth abdominal segment with a distinct, rather wide notch in apex, readily visible when valve is flattened *N. crucifera* Pmn.
Head pale brown and cream in color. Margin of subgenital plate scarcely prolonged medially (fig. 15) and this region bearing four to six stout setae. Inner valve of gonapophyses of ninth abdominal segment with narrow notch in apex, not at all visible when valve is flattened except in macropterous forms *N. peripsocoides*, n. sp.
3. Males with wings unciliated and lacking an areola postica. Subgenital plate bearing slender median process. Inner margin of female paraproct bearing short 'duplex spines' in close proximity to a long, stout spine (figs. 1, 2, 12) *Palmicola*, n. gen. 4

Males with wings ciliated on veins; areola postica present in forewings. subgenital plate lacking median process. Inner margin of female paraproct lacking 'duplex spines' but bearing two long spines in same region

----- *Reuterella* End. (monotype: *R. helvimacula* End.)

4. Head of single specimen (female) buffy yellow. Numerous long, upright setae on dorsum of abdomen. Pigmented areas of subgenital plate shaped as in fig. 14. Jamaican species ----- *P. robinae*, n. sp.
Head some shade of brown. Setae of dorsum of abdomen short, lying flat.
Florida species ----- 5
5. Pigmented area of subgenital plate shaped as in fig. 9. Duplex paraproctal spines of females better developed than in following species (fig. 2). A bisexual species of north-peninsular Florida ----- *P. aphrodite*, n. sp.
Pigmented area of subgenital plate shaped as in fig. 8. Duplex paraproctal spines of females poorly developed (fig. 1). A parthenogenetic species of south-peninsular Florida ----- *P. solitaria*, n. sp.

***Reuterella helvimacula* Enderlein**

Leptella helvimacula Enderlein, 1901, Zool. Jahrb., Abt. Syst. 14:537-548, pl. 35.

Reuterella helvimacula Enderlein, 1903, Zool. Anz. 27:131-134.

Caccilius corticis Pearman, 1924, Ent. Mo. Mag. 60:58-61.

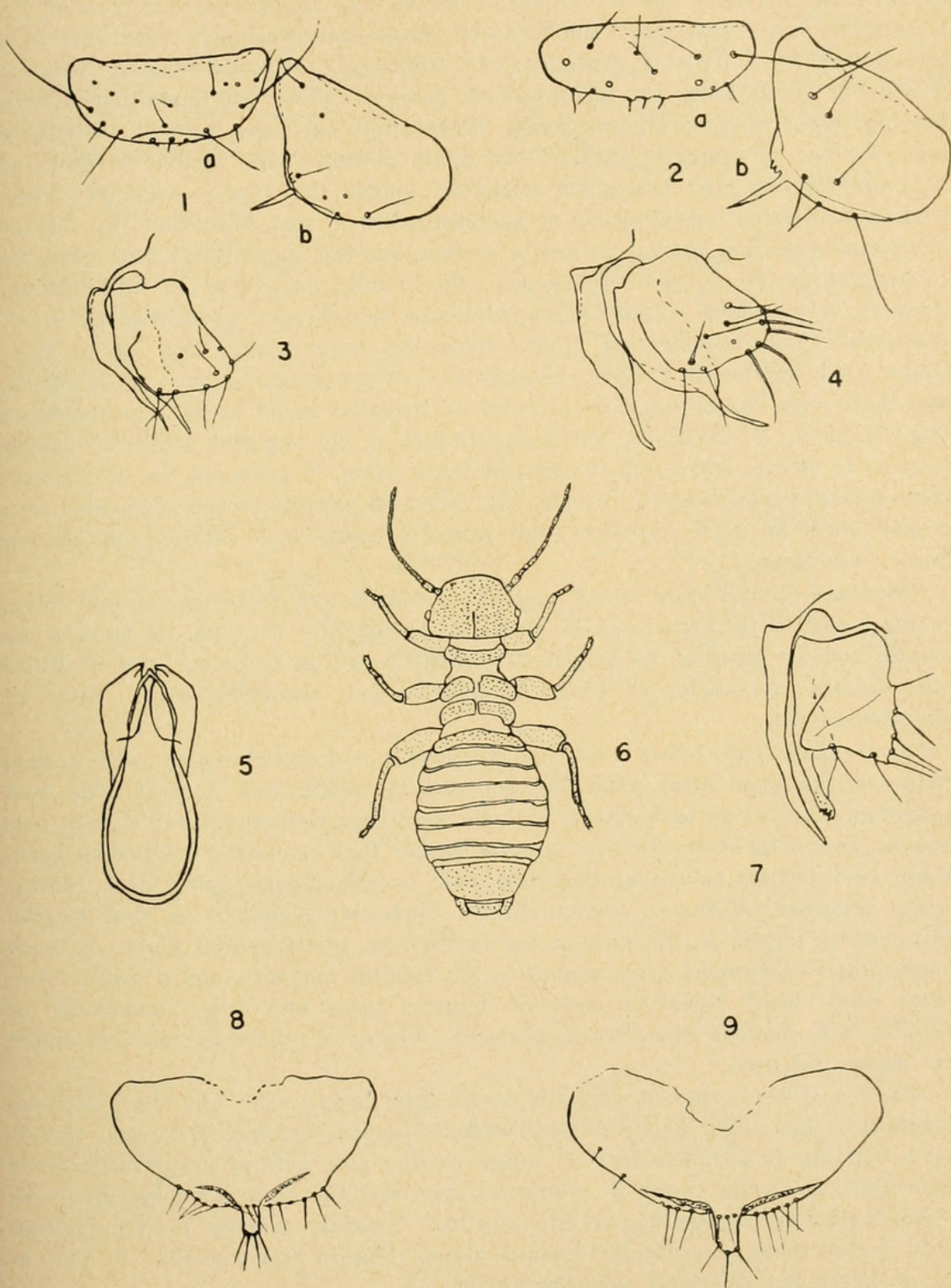
A comparison of female genitalic characters, coloration, size, and proportions was made between specimens of this species sent from England by Mr. J. V. Pearman and Indiana specimens of *Reuterella* sp. The only differences found were (1) slightly smaller size of the Indiana specimens, and (2) presence of only two large setae on each of the processes of the subgenital plate in contrast to three on some of the British specimens. I therefore regard the Indiana specimens as examples of *helvimacula*. I have examined specimens from Illinois collected by K. M. Sommerman and have no doubt that they are the same species.

***Nepiomorpha peripsocoides*, new species**

Diagnosis.—Differs from *N. crucifera* Pearman in pale brown and cream color of head, shorter central process of subgenital plate, and fewer setae on this region, narrower notch in apex of inner valve of gonapophyses of 9th abdominal segment, presence in thoracic tergites of fuscous subcuticular pigment in apterous forms and brown cuticular pigment in macropterous forms, head more prolonged and narrowed in front of eyes, and relatively somewhat longer phallic frame. Macropterous females fairly frequent, whereas winged forms not known for *N. crucifera*.

Holotype Female.—Macropterous. Measurements: total body length 1.39 mm.; forewing length 1.43 mm.; antennal length 0.56 mm.; hind femur + trochanter 0.34 mm.; hind tibia 0.40 mm.

Morphology (from macropterous paratypes and holotype).—Antennae ten-segmented, but apical segment with a constriction before its middle suggesting an incipient division. Antennal segments in ratio 0.42: 1.00: 1.79: 1.79: 0.89: 0.74: 0.58: 0.68: 0.47: 1.58. Antennal sensilla small and difficult to distinguish, apparently distributed as follows: small one lacking appendage in middle of F_1 , small



Palmicola solitaria, n. sp. Fig. 1a (♀), epiproct; fig. 1b (♀), paraproct; fig. 3 (♀), gonapophyses; fig. 8 (♀), subgenital plate. *Palmicola aphrodite*, n. sp. Fig. 2a (♀), epiproct; fig. 2b (♀), paraproct; fig. 4 (♀), gonapophyses; fig. 5 (♂), phallic frame; fig. 6 (♀), dorsal view of paratype (intact); fig. 9 (♀), subgenital plate. *Nepiomorpha peripsocoides*, n. sp.: fig. 7 (♀), gonapophyses.

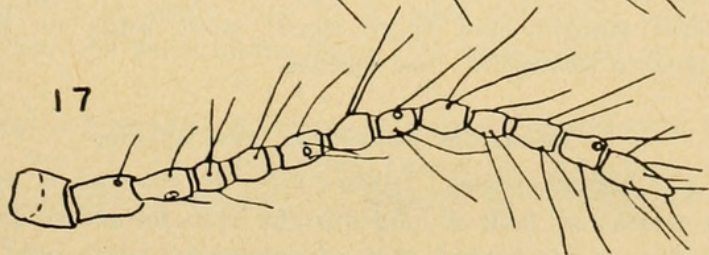
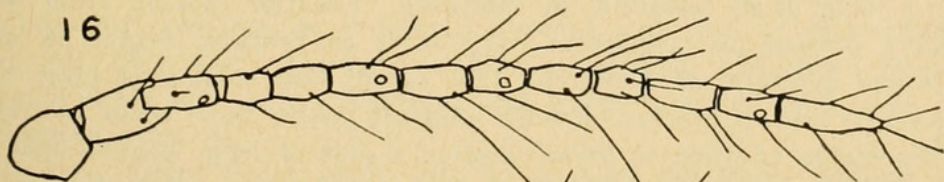
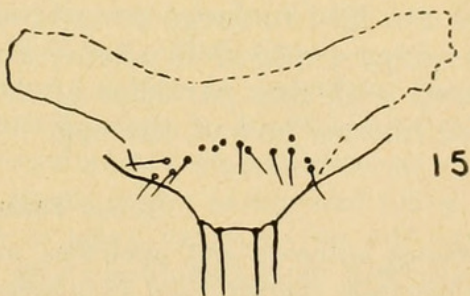
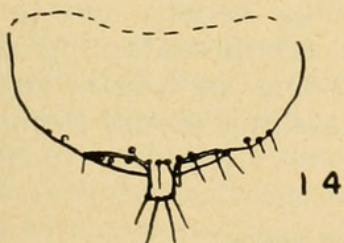
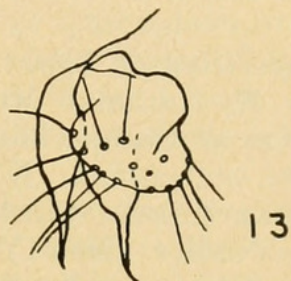
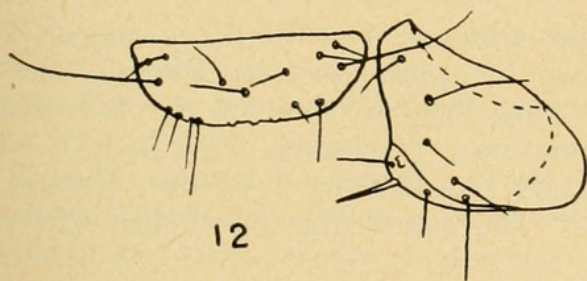
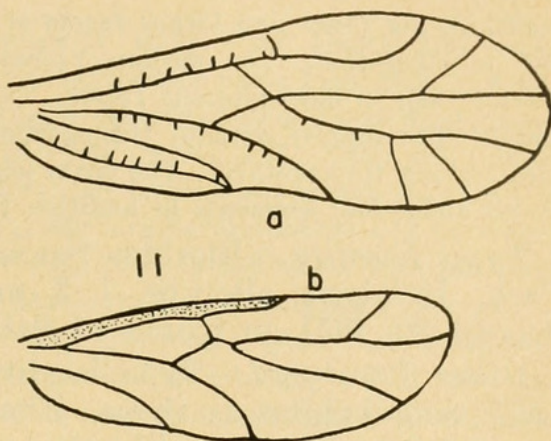
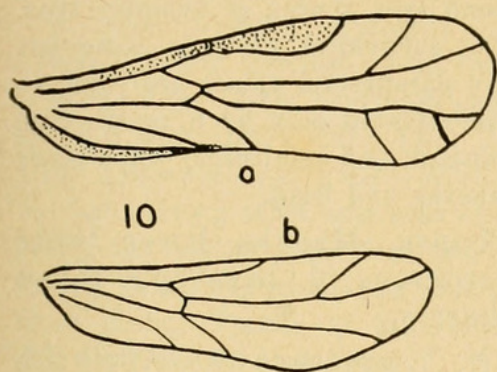
one with short seta on apex of F_3 , small one lacking appendage near apex of F_6 . Eyes fairly large with many small facets. Ocelli well-developed. Maxillary rods terminating in a pair of denticles, one truncated, the other acutely pointed. Thorax of usual form for macropterous psocids: meso- and meta-thorax with bulging tergal lobes; prothorax small. Rasp-type coxal organ present on bulging inner surface of posterior coxa. Tibial spurs absent. Tarsi similar to those of *N. crucifera* but hind basitarsus somewhat longer than apical segment. Forewings considerably exceeding tip of abdomen when at rest. Venation (fig. 11) of *Peripsocus* type, i.e. lacking an areola postica, but this partially present (with no connection to M) in some specimens. Rs broadly joined to M in hindwing. Axillary vein lacking in hindwing. Abdomen shaped and sclerotized as in *N. crucifera*. Paraprocts bearing duplex spines on inner margin, but one of these spines much smaller than other. Sensory area of paraproct bearing trichobothria, and these with 'basal rosettes' in form of irregular ovoid areas. Gonapophyses (fig. 7) as in *N. crucifera*, but gonapophysis of 8th segment somewhat longer relative to others, and notch in apex of inner valve of gonapophysis of 9th segment very slender. Subgenital plate (fig. 15) with sclerotized and pigmented area shaped much as in *N. crucifera*, but apical process much shorter and bearing fewer (4-6) setae.

Ciliation.—'Spiniferous setae' present on vertex and front, mesotergal lobes, radius basad of its branching, M distal to its juncture with Rs, Cu most of its length, and Ax most of its length. Truncated setae on outer surfaces of tibiae near femora; remainder of tibiae bearing normal, acuminate setae. Setae of abdomen normal.

Color.—Head pale brown (cuticular pigment) in occipital region, with a wide stripe of the same color extending forward in middle and another wide area extending forward on each side to include eyes; area between white; clypeus pale brown. Eyes blue-black. Ocellar interval darker than remainder of median band. Scape and pedicel colorless; flagellum pale brown. Tergal lobes dark brown; wings colorless. Abdomen medium brown (cuticular pigment) on first tergite, from eighth tergite to tip, and on pigmented area of subgenital plate. A broad longitudinal white band from second to 7th tergites inclusive, and a broad transverse white band including most of tergites three and four. Remainder of tergites with fuscous subcuticular pigment. Venter of abdomen colorless except for subgenital area.

Allotype Male: Apterous. Measurements: total body length 1.02 mm.; antennal length 0.43 mm.; hind femur + trochanter 0.25 mm.; hind tibia 0.31 mm. Differs from holotype in complete lack of wings, smaller size, lack of ocelli, much fewer and relatively larger facets in compound eyes, and thorax of nymphal type with closely adherent segments and flat tergites. Thoracic tergites mostly colorless with a few small subcuticular fuscous areas. Phallic frame similar to that of *N. crucifera* but relatively somewhat longer.

Palmicola aphrodite, n. sp. Fig. 10a (♂), forewing; fig. 10b (♂), hindwing; fig. 16 (♀), antenna. *Nepiomorpha peripsocoides*, n. sp. Fig. 11a (♀), forewing; fig. 11b (♀), hindwing; fig. 15 (♀), subgenital plate. *Palmicola robinae*, n. sp. Fig. 12 (♀), epiproct (left), paraproct (right); fig. 13 (♀), gonapophyses; fig. 14 (♀), subgenital plate; fig. 17 (♀), antenna.



Variation.—Apterous females occur which are similar to the allotype in lacking ocelli, having fewer and larger facets of compound eyes, thorax of nymphal type, and in coloration. The median process of the subgenital plate is somewhat shorter than in macropterous forms. The duplex paraproctal spines are equal in length. The sensory area of the paraproct is represented only by a round, pale area lacking trichobothria. The coxal organ is absent, and spiniferous setae occur on all abdominal segments in addition to the thorax and head.

Type Locality.—Florida, Sarasota County, Myakka River State Park. Holotype, allotype, 1 ♂ and 5 apterous ♀ paratypes taken August 30, 1951 on trunks of *Sabal palmetto*.

Other Paratypes.—Type locality, 3 ♂, 7 apterous ♀, April 12, 1952, same habitat as above. Florida, Alachua Co., Newnan's Lake, on side of wooden shed, 37 apterous ♀, April 19, 1952, 2 apterous ♀, 11 macropterous ♀, June 18, 1952. Florida, Alachua County, Gainesville, 1 ♂, 3 apterous ♀, October 8, 1952 on north side of brick building.

Disposition of Types.—Holotype, allotype, 1 ♂ and 2 ♀ paratypes in U. S. National Museum. Two ♀ paratypes in Florida State Museum at Gainesville. Two ♀ paratypes in each of the following private collections: K. M. Sommerman (Orlando, Florida), J. V. Pearman (Aston Clinton, England), A. Badonnel (Paris, France), A. M. Nadler (New York City). The remaining paratypes will be retained in my collection.

Biological Notes.—Like *N. crucifera*, these insects spin no web and live in loose groups, the individuals being usually not in contact. Eggs are laid in large groups, one such group containing about 150 eggs; eggs are oval in shape, about 0.37 mm. in length, and each is covered with fine particles of debris. Hatching occurs through a slit at the narrow end of the egg.

Genus *Palmicola*, new genus

Females apterous and otherwise neotenic; males macropterous and adultoid. Male venation characterized by absence of Cu_1 in forewing and absence of Ax in hindwing; a long R-M crossvein in hindwing. Ciliation absent from wings. Duplex spines present on paraprocts, very short on females, longer on males. Mouthparts and genitalia of *Reuterella* type except that subgenital plate terminates in a single central process. Female epiproct nearly three times as wide as long and bearing in addition to other ciliation a pair of long, slender setae, one near each lateral margin, and three short, stout setae on posterior margin. Genotype: *Palmicola aphrodite*, new species.

Palmicola aphrodite, new species

Diagnosis.—A bisexual species. Differs from *P. robinae*, n. sp., in larger size, general darker coloration, lack of long upright hairs on abdominal tergites, deeper anterior impression in pigmented area of subgenital plate, and relatively larger duplex paraproctal spines. Differs from *P. solitaria*, n. sp., in bisexuality, deeper anterior impression in pigmented area of subgenital plate, relatively larger

paraproctal spines, relatively wider gonapophyses, and lack of habit of spinning individual egg webs.

Holotype Female.—Apterous. Measurements: total body length 1.24 mm.; antennal length 0.46 mm.; hind femur + trochanter 0.25 mm.; hind tibia 0.28 mm.

Morphology (from paratypes and holotype).—Antennae 13-segmented; segments in ratio 0.60: 1.00: 0.67: 0.47: 0.60: 0.73: 0.73: 0.60: 0.67: 0.60: 0.67: 0.67: 1.13. Antennal sensilla distributed as follows: one lacking appendage near apex of F_1 , one bearing short seta near apex of F_4 , one lacking appendage (?) near apex of F_6 , one lacking appendage near apex of F_{10} . Eyes rather small, with few large facets. Ocelli and frontal sutures absent. Maxillary rods terminating in a pair of blunt stubs. Thorax of apterous form with flat tergal lobes, but these well separated. Coxal organ absent. Tibial spurs present on all legs, two on front and middle, three on hind. Basitarsi about half as long as apical segments. Abdomen rounded, and sclerotized on first tergite and from eighth to tip. Paraprocts (fig. 2) bearing short duplex spines immediately above a long spine. Sensory area of paraproct absent. Epiproct (fig. 2) with usual ciliation for the genus and not much other. Gonapophysis of eighth and inner lobe of gonapophysis of ninth segment (fig. 4) terminating in long, slender, back-curved processes. Subgenital plate with sclerotized and pigmented areas shaped as in fig. 9, with a deep anterior median impression. Apical process of subgenital plate bearing three or four setae at its terminus.

Color (in alcohol 17 months).—Antennae, legs, head, thoracic tergites, and sclerotized portions of abdomen dull brown (cuticular pigment); eyes purplish-black. Membranous portions of abdominal tergites pale red-brown (sub-cuticular pigment). Abdominal sternites colorless except for pigmented area of subgenital plate.

Allotype Male: Macropterous. Measurements: total body length 1.08 mm.; forewing length 1.02 mm.; antennal length 0.50 mm.; hind femur + trochanter 0.25 mm.; hind tibia 0.28 mm. Differs from holotype in macroptery, slightly smaller size, relatively longer antennae, relatively larger eyes and smaller facets, presence of ocelli, bulging tergal lobes of pterothoracic segments, presence of paraproctal sensory areas bearing trichothria, longer duplex paraproctal spines, and in epiproct being only about twice as wide as long. Venation (fig. 10) characterized by lack of Cu_1 in forewing and lack of Ax in hindwing; an R-M crossvein present in both wings, longer in hindwings. Wings bare of ciliation. Pterostigma and costal cell proximal to it densely covered with minute denticles, these less dense over remainder of wing membrane including hindwing. Phallic frame oblong, rounded anteriorly. Aedeagal arch acute; external parameres quite wide and pointed apically.

Variation.—Some males occur with M in both forewings unbranched, others with M two-branched. In some males Rs and M meet almost at a point in forewings.

Type Locality.—Florida, Alachua County, Newnan's Lake. Holotype, allotype, and 7 ♀ paratypes taken as nymphs on trunk of *Liquidambar* and *Pinus*, reared to adults in laboratory, and killed October 4, 1952.

Other Paratypes.—Type locality, 10 ♂, 7 ♀, mostly taken as nymphs and reared in laboratory, killed from March 14 to August 17,

1952. Florida, Alachua County: Lake Alice, 12 ♀ taken on tree trunks as nymphs and reared to adults in laboratory, killed October 4, 1952; Gainesville, 8 ♀ on north side of brick building from September 22, 1952 to March 1, 1953. Florida, Marion County, near Eureka, 2 ♀ on trunks of *Sabal palmetto* April 10, 1954.

Disposition of Types.—Holotype, allotype, and one pair of paratypes in U. S. National Museum. One pair paratypes in Florida State Museum at Gainesville. One pair paratypes in collections of K. M. Sommerman (Orlando, Florida), and J. V. Pearman (Aston Clinton, England). Two ♀ paratypes in collections of A. Badonnel (Paris, France) and A. M. Nadler (New York City). The remaining paratypes will be retained in my collection.

Biological Notes.—These insects are solitary and live under small webs spun on the bark of trees. Food consists of lichens under the web, and a new web is spun when the food supply under the old one becomes exhausted. Adult webs are seldom over 15 mm. in greatest diameter. Courtship and copulation were observed once when I forced a male to enter the web of a virgin female. After entering the web, the male stopped and scratched rapidly on the floor of the web with his forelegs several times. The female started running about the web and attacked the male with rapid thrusts of the body. Then she ran to the opposite end of the web and remained quiet until the male began scratching the web again. As before, the female responded by running about the web, and after a few seconds ran to the male and mounted his back from behind in such a way as to push his wings out from their resting position. The male raised the tip of his abdomen and they copulated for slightly over a second, facing in the same direction. The female crawled off the male's back after copulation.

It is evident that much of the female's precoital behavior was elicited by the male's scratching on her web rather than the male's presence, alone. Two weeks after the copulation, I scratched gently on the floor of the female's web with a needle. The female approached the needle closely but did not attack it. I then forced a penultimate nymph of *Archipsocus parvulus* (about the same size as the male *P. aphrodite* and bearing long wing pads) into this female's web, and I scratched the floor of the web gently with a needle near the *Archipsocus*. The *P. aphrodite* female approached the *Archipsocus* nymph, and attacked it with rapid thrusts of the body, and mounted its back. From this observation it appears that a visual stimulus, though not very exact, and a tactile stimulus consisting of vibrations produced by web scratching are sufficient to elicit the copulatory response in females of *P. aphrodite*. These observations also suggest that females of this species may copulate more than once.

Eggs are laid under the dwelling web but usually not in contact with each other. They are oval in shape, about 0.40 mm. in length, and are covered with tiny particles of debris. Eggs were laid two days after copulation and about a week after the female became adult.

This female laid 17 eggs which hatched in about 23 days at room temperature; nymphal life lasted about 30 days.

***Palmicola solitaria*, new species**

Diagnosis.—Differs from *P. robinae*, n. sp., in lacking long upright hairs on abdominal tergites, darker coloration, and slightly deeper median impression in pigmented area of subgenital plate. Differs from *P. aphrodite*, n. sp., in apparent lack of males, shallower median notch in subgenital plate, smaller duplex paraproctal spines, and in the habit of spinning individual egg webs.

Holotype Female.—Apterous. Measurements: total body length 0.90 mm.; antennal length 0.34 mm.; hind femur + trochanter 0.22 mm.; hind tibia 0.25 mm.

Morphology (from holotype and paratypes).—Antennae 13-segmented; segments in ratio 0.75: 1.00: 0.75: 0.50: 0.58: 0.75: 0.75: 0.67: 0.75: 0.58: 0.75: 0.67: 1.17. Antennal sensilla distributed as follows: one beyond middle of F_1 , one beyond middle of F_4 , one near apex of F_6 , one at apex of F_{10} ; all apparently lacking appendages. Eyes rather small, with few large facets. Ocelli and frontal sutures absent. Maxillary rods terminating in a pair of points separated by a shallow notch. Thorax of apterous form, as in *P. aphrodite* females. Coxal organ absent. Three tibial spurs on front and middle, four on hind legs. Basitarsi slightly shorter than apical segments. Abdomen rounded and sclerotized as in *P. aphrodite*. Paraprocts (fig. 1) bearing very short duplex spines immediately above a long spine. Sensory areas of paraprocts absent. Epiproct (fig. 1) with usual ciliation for the genus plus numerous other setae. Gonapophysis of eighth and inner lobe of gonapophysis of ninth segment (fig. 3) terminating in long, slender, straight processes. Subgenital plate with sclerotized and pigmented area shaped as in fig. 8, with a shallow anterior median notch. Apical process of subgenital plate bearing four setae at its terminus.

Color (in alcohol 30 months).—Antennae, legs, thoracic tergites, and first abdominal tergite pale brown (cuticular pigment); eyes black. First abdominal tergite and eighth to tip of abdomen medium brown (cuticular pigment); remainder of abdominal tergites dull red-brown (subcuticular pigment). Abdominal sternites colorless except for pigmented area of subgenital plate.

Type Locality.—Florida, Sarasota County, Myakka River State Park. Holotype and 1 ♀ paratype taken August 30, 1951 on trunks of *Sabal palmetto*.

Other Paratypes (all from Florida).—Type locality, 28 ♀ either taken April 12, 1952 on trunks of *Sabal palmetto* or collected subsequently from reared material taken then. Highlands County: Highlands Hammock State Park, 3 ♀ August 14, 1952 on trunks of *Sabal palmetto*. Hendry County: about 5 miles north of Devil's Garden, 1 ♀ April 16, 1954 on trunks of *Sabal palmetto*; Clewiston, 3 ♀ on *Ficus* trunks April 16, 1954. Glades County: 8.6 miles south of Brighton on Indian Reservation road, 1 ♀ April 18, 1954 on trunk of *Sabal palmetto*. Indian River County: Vero Beach, 3 ♀ April 18, 1954 on trunks of *Sabal palmetto*.

Disposition of Types.—Holotype and 2 ♀ paratypes in U. S. National Museum. Two ♀ paratypes in each of collections listed under 'Disposition of Types' for *P. aphrodite*.

Biological Notes.—These insects are solitary and live under small webs similar to those of *P. aphrodite* in size and appearance. Like *P. aphrodite*, they feed on lichens under the web and spin a new web when the food supply under the one in use becomes exhausted. They are apparently obligatorily parthenogenetic, as they were reared in the laboratory through three generations without the appearance of males.

To determine the response of females of this species to males of *P. aphrodite*, I forced a male of the latter to enter webs of two females of the former. In neither case did these females exhibit a positive response to this male, but in both cases the females finally ran out of their webs as a result of disturbances caused by the male.

Eggs of *P. solitaria* are about the same size and shape as those of *P. aphrodite*. There is no debris on their shells, but each egg is completely covered by a tiny, dense, white web. These webs appear to the naked eye as tiny white spots in the dwelling web. Eggs were found at Highlands Hammock State Park, Florida, in August.

Palmicola robinae, new species

Diagnosis.—Differs from *P. aphrodite* n. sp. and *P. solitaria* n. sp. in paler coloration especially of head, presence of numerous long, upright hairs on all abdominal tergites, and shallower anterior median notch of pigmented area of subgenital plate. Differs from *P. aphrodite* also in smaller size. Antennae (fig. 17) bearing relatively longer setae than in other two species (*P. aphrodite*, fig. 16).

Holotype Female.—Apterous. Measurements: total body length ± 0.98 mm.; antennal length 0.40 mm.; hind femur + trochanter 0.22 mm.; hind tibia 0.23 mm.

Morphology.—Antennae 13-segmented; segments in ratio 0.91: 1.00: 0.82: 0.54: 0.54: 0.82: 0.73: 0.64: 0.73: 0.64: 0.73: 0.73: 1.27. Antennal sensilla distributed as follows: one (two together?) near apex of F_1 , one in middle of F_4 , one slightly beyond middle of F_6 , one at apex of F_{10} ; all apparently lacking appendages. Eyes rather small with two facets. Ocelli and frontal sutures absent. Maxillary rods terminating in a pair of toothed points, separated by a rather deep notch. Thorax of apterous form as in *P. aphrodite*. Coxal organ absent. Three tibial spurs on front and middle, four on hind legs. Basitarsi slightly greater than half length of apical segments. Abdomen sclerotized as in *P. aphrodite* and about the same shape. Paraprocts (fig. 12) bearing very short duplex spines above a long spine. Sensory areas of paraprocts absent. Epiproct (fig. 12) with usual ciliation for the genus (some setae dislodged in mounting) plus numerous other setae. Gonapophyses (fig. 13) of typical form for the genus. Terminal process of gonapophysis of eighth segment straight, that of inner valve of gonapophysis of ninth segment bent (artifact?). Outer valve of gonapophysis of ninth segment bearing more setae than in other two species. Subgenital plate (fig. 14) with very pale pigmented area scarcely showing an anterior median impression; its apical process bearing four setae terminally.

Color (in alcohol 20 months).—Generally pale brown in sclerotized portions (cuticular pigment), but head dull yellow. Membranous abdominal tergites pale red-brown. Eyes black.

Type Locality.—Jamaica: Hardwar Gap (altitude over 4000 ft.). Holotype and one nymph taken in July, 1952, on bark of tree in cloud forest.

This species is named for Mrs. Robin Krivanek who collected the type in addition to other psocids in Jamaica.

Disposition of Type.—The holotype will be retained in my collection until topotypes can be obtained.

DEFINITION AND TAXONOMIC POSITION OF THE REUTERELLINAE

As used in this paper, the Reuterellinae may be defined as a group of psocids characterized as follows: 13 or fewer antennal segments; two tarsal segments; usually all, and always some females of each species apterous; antennae of apterous forms much reduced in length; gonapophyses of a type in which all three valves are well developed and those of the eighth segment terminate as long, slender processes; subgenital plate bearing a transverse row of setae; male genital armature an oblong, symmetrical phallic frame with well developed external parameres; wings with little or no ciliation.

The quality and quantity of characters in this definition strongly suggest that the group is monophyletic, and a definition based on the inclusion of any other known psocid species would lower the probability of monophyly. Hence I have chosen to exclude *Graphocaecilius*, *Hemicaecilius*, and *Reuterella neglecta* Roesler (1935). According to Pearman (in litt.) the latter species is not a *Reuterella*.

The history of the taxonomic position of the Reuterellinae may be summarized briefly as follows:

1. Enderlein (1903)—erected Reuterellinae as monotypic subfamily of Caeciliidae.
2. Badonnel (1943)—placed *Reuterella* in Elipsocidae with no subfamilies.
3. Roesler (1944)—placed Reuterellinae in Pseudocaeciliidae. Divided it into two tribes: Graphocaeciliini including *Hemicaecilius* and *Graphocaecilius*; Reuterellini including *Reuterella* and *Nepiomorpha*.

I would consider the Reuterellinae to be a subfamily of Elipsocidae, distinguishable from other Elipsocid groups by possession of only two tarsal segments.

GEOGRAPHICAL DISTRIBUTION OF THE REUTERELLINAE

Reuterella helvimacula is found in England, northern Germany, Finland, the Vosges Mountains in France, Polish Galicia (Carpathian Region), and in Switzerland (Badonnel, 1943: 86). In North America, it has been taken in one locality in Indiana and one in Illinois. This wide and spotty distribution suggests that the species is a relict, perhaps with a more nearly continuous distribution in the Pleistocene. There is little possibility of its introduction by man from Europe as its North American localities of occurrence are very remote from human habitation.

The two species of *Nepiomorpha*, *N. crucifera* in Ceylon and *N. peripsocoides* in Florida, are both found in peripheral regions at the southern ends of continents. This genus, then, is probably another relict group, and its present distribution suggests a northern origin.

The genus *Palmicola* appears to be confined to the Caribbean Region including Florida. *P. aphrodite* occurs in north-peninsular Florida, *P. solitaria* occurs in south Florida, and *P. robiniae* occurs on Jamaica. That the species are allopatric and very similar to each other morphologically suggests that they have arisen recently.

The entire facies of the Reuterellinae—its very distinct genera of few species, and its far-flung, spotty distribution—suggest that it is a group of great antiquity which probably is becoming extinct.

SUMMARY

The Reuterellinae appears to be a monophyletic group of three genera (*Reuterella* End., *Nepiomorpha* Pmn. and *Palmicola* n. gen.) and six species, four of which are first described herein. Taxonomically, Reuterellinae is best considered a subfamily of the Elipsocidae. The Reuterellinae appears to be an ancient group and some of its representatives probably had wider ranges in the past than at present.

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ANNOUNCEMENT

The American Museum of Natural History has established a Southwestern Research Station on the eastern slope of the Chiricahua Mountains, near Portal, Cochise County, in southeastern Arizona at an elevation of 5400 feet. The station is designed to make research facilities available to workers in all branches of science who are interested in the flora and fauna of that area. Details may be obtained from Dr. Mont A. Cazier, American Museum of Natural History, Central Park West at 79th St., New York 24, N. Y.



Mockford, Edward L. 1955. "Studies on the Reuterelline psocids (Psocoptera)." *Proceedings of the Entomological Society of Washington* 57, 97–108.

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