LOPHOPIDAE OF THE AMAZON BASIN WITH KEYS TO NEW WORLD GENERA AND SPECIES (HOMOPTERA: FULGOROIDEA).

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SUMMARY

The two species of Lophopidae found in the lowland Amazon Basin, ***Hesticus rufimanus*** *(Walker) and* ***H. sanguinifrons*** *Muir, are redescribed and their geographical distributions given. Keys are provided to genera of New World Lophopidae, and to species of* ***Hesticus***.

INTRODUÇÃO

Lophopidae is a very small family of Fulgoroidea, with only 42 genera and 111 species known (Metcalf, 1947), of which only four genera and six species are known from the New World (Metcalf, 1955). The family is most common in the Old World tropics, and very little is known of the New World species, although the 22 specimens of **Silvana omani** Metcalf were collected from the tree **Britoa acida** in Bahia, and **Hesticus rufimanus** has been collected on forest understory plants. One Old World species, **Lophops saccharicida** Kirk., is found on grasses and sugar cane in Australia (Woodward, **et al.**, 1970), and another, **Pyrilla perpusilla** Walker, is a serious pest of sugar cane in India (Rahman & Nath, 1940).

Pyrilla perpusilla is perhaps the best known species in the family and some notes are included to give an idea of lophopid biology.

Elongate, oval, white eggs are laid in clusters of 20 to 50 on the underside of leaves or behind the leaf sheath. One female may lay up to 773 eggs. There are five nymphal stages, lasting 24-65 days in cool weather, and 78-208 days in warmer weather. Adults may live up to 200 days, but usually live less time in warmer climates. This species not only attacks sugar cane, but also may attack wheat,barley,oats,guinea grass and other gramineous crops.

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Systematics

The Lophopidae can be defined as having the following set of characteristics: second hind tarsomere very small and without apical row of spines, clavus not extending to apical part of forewing, frons usually longer than wide (**Carrionia** has a frons as long as wide), and clypeus usually with lateral carinae (**Ucayalia** has a carina only on the basal half).

In the New World, Lophopidae have only been found in tropical South America from Peru and Brazil to Guiana. Since two monotypic genera occur on the upper tributaries of the Amazon, no elevation given, another in Bahia, and two species of the genus **Hesticus** are found in Manaus and Iquitos, and the third species in Rio de Janeiro, it seems wise to give a key to the genera and species here, as more may be collected in the lowland Amazon.

KEY TO THE GENERA OF NEW WORLD LOPHOPIDAE

1a. Pro and meso femora and tibiae both thin and expanded; ocelli absent 2
1b. Profemora and tibiae expanded or not; ocelli present on genae 3
2a. Vertex at least 1.9 times as long as broad; clypeus with median and lateral carinae ..... **Ucayalia** Fennah
2b. Vertex less than 1.5 times as long as broad; clypeus with median, but without lateral carinae ..... **Carrionia** Muir
3a. Forewings membranous; pro-femora and tibiae expanded ..... **Hesticus** Muir
3b. Forewings colored and opaque; pro-femora and tibiae not expanded, subequal to meso-femora and tibiae ..... Silvanana Metcalf

List of New World species of Lophopidae

Carrionia flavicollis Muir, 1931	Ecuador
Hesticus pictus (Walker, 1858)	Brazil
Hesticus rufimanus (Walker, 1858)	Brazil, Guiana
Hesticus sanguinifrons Muir, 1931	Ecuador, Peru
Silvanana omani Metcalf, 1947	Brazil
Ucayalia nigrovittata Fennah, 1944	Peru

The species of the genus **Hesticus** can be separated using the following key:

KEY TO SPECIES OF **HESTICUS**

1a. Frons longer than broad (1.4:1); lateral carinae of base of clypeus elevated above median area; length of fore femur 3.5 x width at apex 2
1b. Frons as broad as long; lateral carinae of clypeus scarcely elevated; length

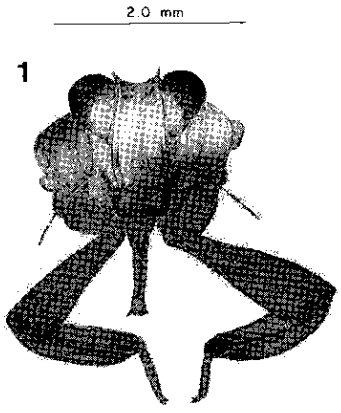
of fore femur 3x width at apex; clavus and band along apical area of forewing brown (Rio de Janeiro) ..... **H. pictus**

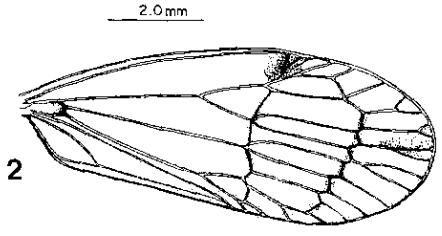
2a. Median red stripe, sometimes broken into two spots, down frons and clypeus (Ecuador and Peru) ..... **H. sanguinifrons**

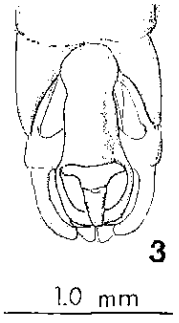
2b. Frons pale except median apical dark spot joined to black transverse band at base of clypeus (partially extending medially to frons) (Brazilian Amazon to Guiana) ..... **H. rufimanus**

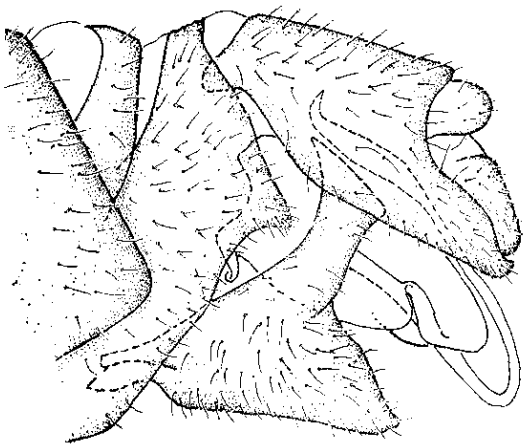
Only two species, redescribed below, have been collected in the lowland Amazon Basin.

Hesticus rufimanus (Walker, 1858)
(Figs. 1-6, Map 1)









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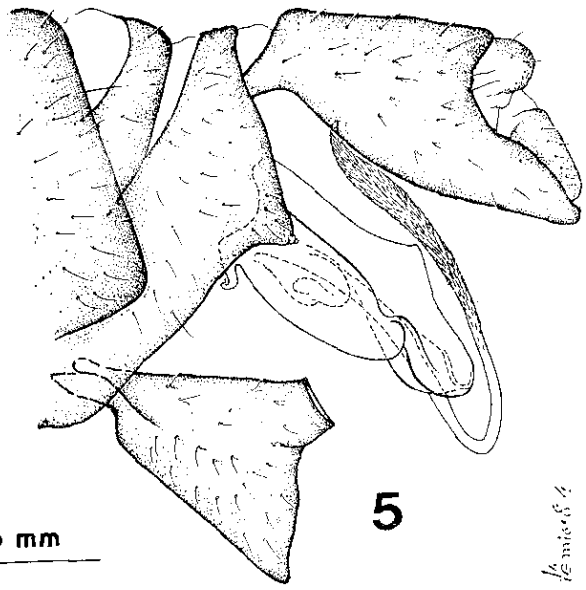

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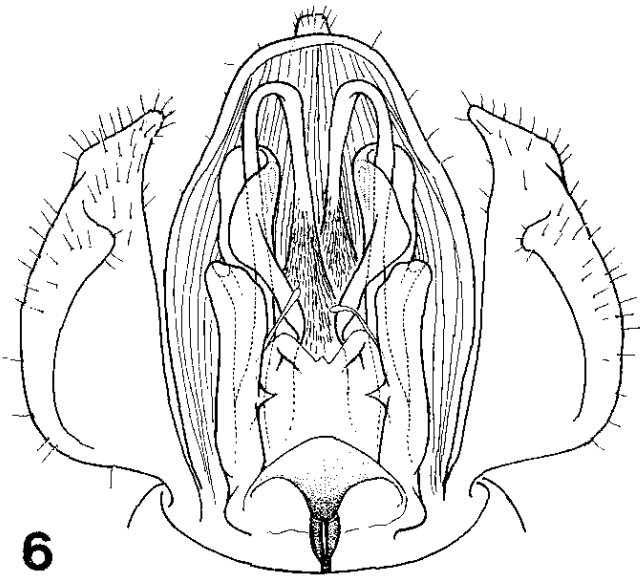
0.5 mm



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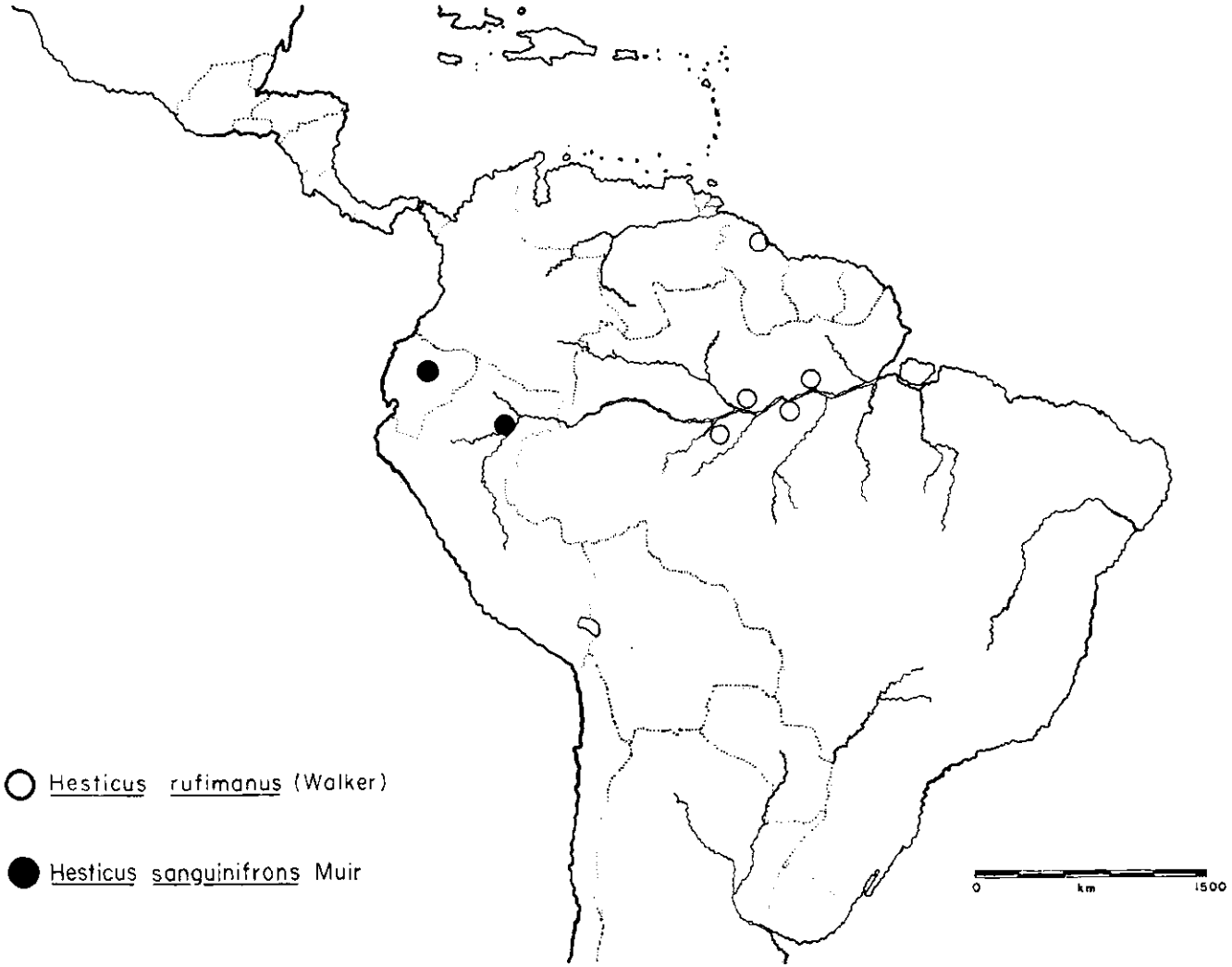
0.5 mm

Figs. 1-6. **Hesticus rufimanus** (Walker). 1) Head and pronotum, in frontal view, 2) Right forewing, 3) male genital capsule, dorsal view, 4) male genital capsule, left lateral view, 5) male aedeagus, left lateral view, 6) male aedeagus, ventral view. Drawings by Artemio Coelho da Silva.



Map. 1. Geographical distribution of **Hesticus rufimanus** and **H. sanguinifrons**.

Cladodiptera rufimana Walker, 1858, **List of Homoptercus Insects**, supplement 1858: 77.

Hesticus rufimanus (Walker) Muir, 1931, **Proc. Hawaiian ent. Soc.**, 7:480.

Holotype in British Museum (Natural History), London.

Present description based on holotype, 2 males, 1 female, pinned.

Head: Vertex and frons (Fig. 1) pale greenish yellow; lateral carinae distinct, somewhat elevated; two transverse carinae, ventral one being indistinct; medial carina indistinct. Clypeus dark brown dorsally, pale greenish yellow ventrally; dorsally with elevated lateral carinae. Compound eyes slightly emarginate, bright red. Lateral ocelli bright red, at anterio-ventral margin of compound eyes. Second antennal segment tubular about five times as long as wide, bearing small, round dentate placs. Genae and lateral margin of clypeus marked with series of broad transverse bands, being dorsally to ventrally pale green, reddish brown, white, dark brown, and yellowish green.

Thorax: Pronotum medially carinate, lateral carinae curved, meeting hind margin or ventro-lateral carinae near tegulae; narrow dorsally, medial disc elevated; medially pale orange behind eye, laterally with bands of white and bright orange. Tegulae indistinctly carinate. Mesonotum tricarinate with orange longitudinal median stripe and two basal oval orange areas behind eyes, flanked by greenish areas, or if color faded, by pale yellow areas. Faint transverse sulcus separating scutellum from rest of mesonotum. Pleural areas pale green.

Legs: Fore femur and tibia broadly flattened, bright orange; apex of fore femur and tibia sometimes with faint transverse brown band and sometimes lateral brown area on tibia. Fore tarsi and mid and hindlegs pale green. Hind tibia with three spines along longitudinal ridge, and 10 apical spines. First hind tarsomere large, with 8 apical spines. Second hind tarsomere small, lacking apical spines.

Wings: Fore- and hindwing membrane transparent, with dark infuscation on forewing at crossveins, pterostigma and wing apex; on hindwing only at wing apex. Longitudinal veins pale brown; crossveins darker brown (Fig. 2). Costal vein indented from wing margin to pterostigma. Subcosta fused with radius to pterostigmal area. R1 apically forked at level of apical crossveins; Rs originating in apical half of wing, forked at subapical crossveins, and R3 forked beyond apical crossveins. Anterior medius originating from basal cell; forked at level of subapical crossveins, and MA1 forked beyond apical crossveins. Very strong basal m-cu crossvein. Cubitus vein forked at level of origin of radial sector. United claval veins reaching forewing margin just before apex of clavus.

Abdomen: Dark orange-brown dorsally and pale yellow to orange ventrally, sometimes with brown longitudinal stripe down each side. Male anal segment very large, triangular, dark brown apically, extending well beyond apex of styles; in dorsal view, not medially cleft (Fig. 3). Styles ventrally triangular, with very long, narrow dorsal projection almost touching opposing projection at midline above aedeagal complex. Pygofer with small, acute, lateral projection (Fig. 4). Aedeagus with two ventral flanges fused into

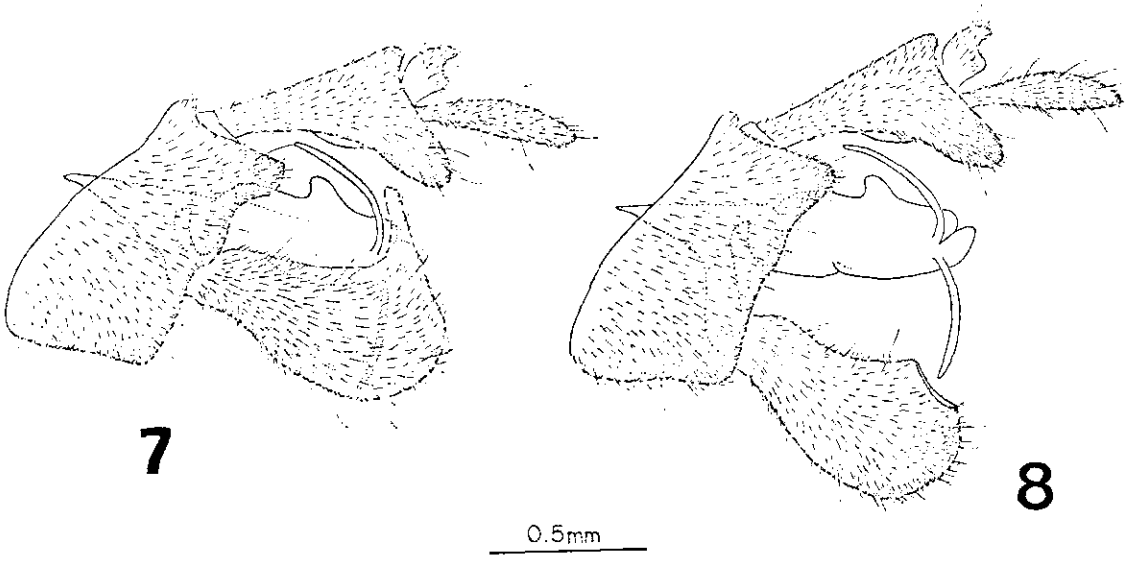
recurved ventral projection at base, with two long dorsal spine-like projections which recurve apically, and terminate anteriorly near base of anal segment as two acute points (Figs. 5, 6); base of aedeagal complex connected to base of pygofer by narrow, medial rod. Ventral surface of anal flap concave medially.

Length: 10.0 mm.

Geographical Distribution: Holotype from BRAZIL: Amazonas, Parintins (formerly called Villa Nova). Muir (1931) mentioned this species from BRAZIL: Amazonas, Rio Autazes, A. Roman. Metcalf (1945) mentions a specimen of this species (under the name **H. pictus**) from Kartabo, GUIANA. In the INPA Systematic Entomology Collection are three specimens from BRAZIL: Amazonas, BR-319, km 102 (near Castanho), 17-IX-1979, J.R.Arias, 1 male; CEPLAC (AM-010, km 30), 6-V-1976, E. Vieira, 1 male; Pará, Rio Trombetas, Cruz Alta, 22-XI-1982, N. D. Penny, 1 female.

Species Relationships: This species is smaller than **H. pictus** (Walker), and is distinctive because of the single dark band across the clypeus. **H. pictus** has a dark transverse band on both clypeus and frons. It may quickly be separated from **H. rufimanus** and **H. sanguinifrons** by the dark stripe along the commissural margin of the forewing.

Hesticus sanguinifrons Muir, 1931
(Figs. 7-8)



Figs. 7-8. **Hesticus sanguinifrons** Muir. 7) male genital capsule, left lateral view, 8) male aedeagus, left lateral view. Drawings by Lois O'Brien.

Hesticus sanguinifrons Muir, 1931, **Proc. Hawaiian ent. Soc.**, 7:480.
Holotype female in the Bernice P. Bishop Museum, Honolulu, Hawaii.
Present description based on one male, pinned.

Head: Vertex and frons pale greenish yellow, with median longitudinal red stripe; lateral carinae distinct, somewhat elevated; two transverse carinae, ventral one being indistinct; medial carina distinct. Clypeus with median longitudinal red stripe, pale greenish yellow laterally; dorsally with slightly elevated lateral carinae.Compound eyes slightly emarginate, bright red. Lateral ocelli bright red, at anterio-ventral margin of compound eyes.Second antennal segment tubular, about two times as long as wide, bearing small, round dentate placs. Genae and lateral margin of clypeus pale yellowish green.

Thorax: Pronotum medially carinate,lateral carinae curved,meeting hindmargin near tegulae; narrow dorsally, medial disc slightly elevated; yellowish orange. Tegulae carinate. Mesonotum tricarinate, orange, with apex separated from rest by faint transverse depression.

Legs: Fore femur and tibia broadly flattened, bright orange; apex of fore tibia and lateral margin sometimes with faint transverse brown area. Fore tarsi and mid and hindlegs orange. Hind tibia with three spines along longitudinal ridge, and 10 apical spines. First hind tarsomere large, with 8 apical spines. Second hind tarsomere small, lacking apical spines.

Wings: Fore- and hindwing membrane transparent, with dark infuscation on forewing in costal area before pterostigma and fainter at wing apex; four veins of pterostigma bright red. Longitudinal veins pale brown; crossveins darker brown.Costal vein indented from wing margin to pterostigma. Subcosta fused with radius to pterostigmal area. R1 apically forked at level of apical crossveins; Rs originating in apical half of wing, forked at subapical crossveins, and R3 forked beyond apical crossveins. Anterior medius originating from basal cell; forked at level of subapical crossveins, and MA1 forked beyond apical crossveins. Very strong basal m-cu crossvein. Cubitus vein forked at level of origin of radial sector. United claval veins reaching forewing margin just before apex of clavus.

Abdomen: Dorsum medially and laterally orange, with brown longitudinal stripe down each side; venter yellowish orange. Styles rounded, ventral projection not attenuate apically. Pygofer with dorsal projection larger and more rounded. Aedeagus with dorsal median projection and with two pairs of subequal spine-like projections.Ventral surface of anal flap concave medially.

Length: male, 12.2 mm.

Geographical Distribution: Holotype female from ECUADOR: Tena, 4-III-1923, F. X. Williams (Bishop Museum). One additional male from PERU: Iquitos (Stockholm Museum).

Species Relationships: *This species is smaller than* ***H. pictus*** *(Walker), and is* distinctive because of its vertical median bright red stripe on frons and clypeus. ***H. pictus*** has a basal dark band on both frons and clypeus and the forewings are darker than *in other species because of the dark brown clavus and apical band.*

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We wish to thank Dr. John T. Medler, for examining the type of **H. sanguinifrons** in Honolulu, Mrs. Carol Parron, for sending paratypes of **Silvanana** from North Carolina State, Dr. Per Lindskog, Naturhistoriska Riksmuseet, Stockholm, for loan of specimens, including the specimen of **H. sanguinifrons** dissected, Dr. Randall T. Schuh of the American Museum of Natural History for loan of the type of **Ucayalia**, Peter Broomfield, for examining the type of **Carrionia** in the British Museum (Natural History), CNPq's Projeto Trópico Úmido grant no. 3224 for financial support, and ALCOA Mineração S.A. and Billiton Metais S.A. for their help and courtesy during a visit to their operations at Cruz Alta, especially to Albert Guirret for his personal supervision and help during our stay. The Interamerican Development Bank is to be thanked for funds to allow one of us (N. D. P.) to examine a holotype at the British Museum (Natural History). Artemio Coelho da Silva made the illustrations.

RESUMO

As duas espécies de Lophopidae que existem na Bacia Amazônica, ***Hesticus rufimanus*** *(Walker) e* ***H. sanguinifrons*** *Muir são redescritas e suas distribuições geográficas dadas. Chaves são dadas aos gêneros de Lophopidae do Novo Mundo e as espécies do gênero* ***Hesticus****.*

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