

New and Little-Known Fulgoroidea from South America

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The finding of a typical representative of Lophopidae in South America and the placing of a less typical species into that family is of interest as this is the first recognition of the family from either North or South America.

It is nearly impossible to work on the genus *Dictyophora* at present, as it contains a miscellaneous collection of forms; a few have been segregated into other genera but others equally distinct from the type remain within the genus. The best characters appear to be in the head and until these have been more adequately described and figured it is difficult to work upon the genus except on specimens one has access to. The difficulty, and also the interest, lies in the fact that starting from any one type there are gradations of forms in several directions. This will be recognized in the genus *Taosa* Distant dealt with below.

DICTYOPHORIDAE

Taosa Distant

Distant erected this genus in 1906 with *Flata suturalis* Germ. as the type. This species had been placed by Stål into *Nersia*, by Walker into *Cladodiptera* (as *muliebris*) and by Berg into *Dictyophora*. The chief characteristic of this genus is the short head, the vertex not projecting in front of the eyes, or only slightly, with a transverse carina dividing the base of the frons from the vertex. An examination of a series of species shows that the position of this transverse carina differs in nearly every species, in some being straight and not projecting in front of eyes, in others being curved and projecting in front of eyes. To draw a line between these extremes would be difficult and arbitrary. There is one character which binds them together which I think should be considered as the generic character, namely, a small angular area at the point where the transverse carina joins the lateral margins.

Apart from this some of the species are difficult to separate from some of the short-headed Dictyophora.

Many species of Dictyophora have been described without adequate description or figures of the structure of the head, and so it is impossible to identify them with certainty. It is possible that some of the following species described as new have already been described in Dictyophora, but I must leave it for those having the types to make the comparison.

Melichar gives *Flata vitrata* Fabr. as the genotype, but makes no statement why he does so.

1. *Taosa viridis* sp. n. Fig. 1.

Male: Length 6 mm.; tegmen 8 mm.

Vertex short, broad, width 2.7 the length, apex and base equally curved; base of frons as seen from above swollen in middle with indications of the medio-lateral carinae. Length of frons 1.5 the width, carinae distinct except at extreme base. Hind basitarsus long, narrow, apex not expanded, truncate, with seven or eight minute spines; second tarsus narrow, not expanded at apex, with seven or eight minute spines at the truncate apex.

Green; two black, shiny marks at base of frons over the medio-lateral carinae; a shiny black dot on mesopleura near base of tegmen; the longitudinal ridges of front and middle legs brown, forming fine lines, the tarsi fuscous. Genital styles and anal segment dark brown. Tegmina hyaline, veins greenish brown, darker brown in membrane; stigma four-celled, dark brown. Wings hyaline with brown veins.

One male from Brazil, Amazon, during trip between Manaus and Teffé (Ega) and back again (A. Roman, April, 1915). Type in Stockholm Museum.

2. *Taosa bimaculifrons* sp. n. Figs. 2, 3.

Male: Length 7 mm.; tegmen 10 mm.

Transverse carina on vertex about level with the anterior margins of the eyes, slightly curved, width 1.8 the length; posterior margin slightly concave, the base of the frons as seen from above swollen in the middle. Frons widest on apical half where the sides are round, length 1.4 times the width; median and medio-lateral carinae distinct, obscure at base, the suture between clypeus and frons very slightly curved. Apex of hind tibia expanded, with eight large spines; basitarsus fairly broad, apex not expanded, with seven small, even spines; second tarsus fairly large, apex not expanded much, with seven even small spines. Male genitalia figured.

Yellow or light reddish brown; two black, shiny marks at base of frons covering the bases of the medio-lateral carinae; three dark marks on metapleura; hind coxae dark with the meracanthus light, hind trochanter fuscous. The tegmina hyaline, veins brown, those in membrane darker than in corium; stigma light brown, in one tegmen two-celled, in the other three-

celled, commissure of clavus dark; apical margin slightly fuscous extending into cells at apex of Sc and M 1 and 2. Wings clear hyaline, veins brown, no marks.

Female similar to the male in build; the sixth and seventh abdominal sternites dark brown, also the ninth tergite, the dorsal valvulae and the apex of anal segment; the ridges of front and middle legs are brown, which is hardly perceptible in the male.

One male, Brazil, Belem (F. X. Williams, VI, 1924) and one female Ecuador, Tena (F. X. Williams, IV, 1923). Type in H. S. P. A. Experiment Station, Honolulu.

3. *Taosa lineatifrons* sp. n. Fig. 4.

Female: Length 7.2 mm.; tegmen 9 mm.

The transverse carina curved considerably more than the hind margin; at the sides considerably shorter than in the middle, width nearly twice the length; the base of frons in dorsal view evenly rounded, not swollen in middle; length of frons 1.2 times the width, carinae obscure. Apex of hind tibia somewhat expanded, seven or eight large spines; first and second tarsi comparatively short, expanded at apex with the apex V-shape, a large spine at each corner and a double row of thin, long spines, backed by the usual flattened hairs.

Head light brown, two wide, longitudinal dark brown marks down frons covering the medio-lateral carinae, turning out towards the apex; clypeus marked with brown, two small dark spots in vertex. Pronotum fuscous brown, light in the middle and with lighter mottling; mesonotum dark brown, lighter down the middle, with light branch-like markings on the darker portion; tegulae light. Legs and pleura light with darker markings; front legs with obscure fuscous bands; middle and hind femora with obscure longitudinal marks. Abdomen dark brown, dorsally with three fine broken lines down the middle; pleura light; hind margin of sternites narrowly light. Tegmina hyaline, veins brown, light in corium, dark in membrane; stigma three-celled, dark brown; claval commissure dark brown extending slightly into cell; a fuscous mark in membrane over radial and median apical cells extending half way across membrane along M 3, 4 and Cu 1. Wings hyaline, veins dark brown, a fuscous mark at apex of Cu.

One female from Brazil, Villa Americana (F. X. Williams, II, 1924). Type in H. S. P. A. Experiment Station, Honolulu.

4. *Taosa terminalis* (Germ.).

One female from Costa Rica, Matina; one male from British Guiana, Blairmont (F. X. Williams, X, 1923) and one female from British Guiana, New Amsterdam (F. X. Williams, VIII, 1923). These specimens agree with *Cladodiptera virilis* Walk. which has been synonymized with *terminalis* Germ., but they do not entirely agree with Melichar's description of the latter. The

transverse carina at apex of vertex is about level with the anterior margin of eyes, the width of vertex 1.7 the length, the base of frons visible in dorsal view is rounded and smooth, not swollen in middle as we find in *bimaculifrons*.

5. *Taosa pseudoscriptiventris* sp. n.

Female: Length 8 mm.; tegmen 9.7 mm.

Width of vertex nearly twice the length; apex in line with the anterior margin of the eyes, nearly straight; sides of the triangular areas subequal in length; carinae of frons obscure.

Light brown, the two triangles black and a small black mark in the middle of each half of vertex. The medio-lateral carinae of frons dark brown, widest at base and gradually thinning out towards apex; median carina also dark; clypeus dark brown on each side of median carina. Pronotum light with small darker marks; mesonotum and metanotum dark brown with lighter marks. Abdomen dark brown with lighter marks; in the middle of the tergites these marks take on the shape of a wide inverted V, the apex on the posterior portion of one segment and the arms reaching to the posterior margin of the next; on the sides there are small oblong marks. On the sternites the hind margins are narrowly margined with light which is in turn margined with a narrow dark line. Tegmina hyaline with brown veins; stigma brown, the dark color extending over the nodal line slightly into the cells. Some irregular brownish marks in the apical and subapical cells of M. Wings hyaline with brown veins, a brown mark on margin at apex of Cu.

One female from Brazil, Parana (E. D. Jones, 1905). This comes next to *Cladodiptera scriptiventris* Walker which is also a *Taosa*. Type in British Museum.

6. *Taosa scriptiventris* (Walker). New combination.

Cladodiptera scriptiventris Walker, 1858, Cat. Hom. Supp. p. 76.

Nersia scriptiventris (Walker) Stål, 1862, Op. Vet. Ak. p. 487.

Cladypha scriptiventris (Walker) Melichar, 1912, Monog. Dictyophorinen.

This species has all the characters of *Taosa*. It has no cross vein in the clavus.

7. *Taosa holmgreni* sp. n. Fig. 5.

Male: Length 5.7 mm.; tegmen 8.2 mm.

Vertex small, wider than long (1 to .65), the portion of the frons visible from above nearly equal to the length of vertex; the width of vertex subequal to the width of an eye; the transverse carina not quite level with the anterior margin of eyes. The medio-frontal carina distinct, medio-laterals indistinct. First and second hind tarsi not much expanded at apex, each with an even row of small spines at apex.

Head light brown or stramineous; two small brown marks on vertex, a shiny brown mark down the middle of frons divided into two by the lighter median carina, the dark mark becoming narrower apically; clypeus darker at apex and sides and on each side of median carina. Pronotum light, carinae lighter, a dark mark on each side behind antennae. Mesonotum dark brown, light in the middle in the shape of a cross, and along the hind margin; pleurites mostly dark edged with light; femora brown with longitudinal light lines; front and middle tibiae and tarsi darker brown, hind tibiae and tarsi lighter; abdomen dark brown, one median mark reaching to apex and two medio-laterals reaching half way on dorsum light, pleura light. The sternites light in middle. Tegmina hyaline, shiny, commissure dark brown, extending into the hind claval cell, a dark brown mark from apex of clavus to apex of membrane extending over most of the apical cells; veins brown. Wings hyaline, shiny, brown veins; a fuscous mark on margin at the apex of Cu.

Three males from Camory on frontier between Peru and Bolivia, east side of Andes (N. Holmgren). Type in Stockholm Museum.

8. *Taosa viridifrons* (Walker). Fig. 6.

Cladodiptera viridifrons Walker, 1858, Ins. Saund. Hom. p. 41.

Cladypha viridifrons (Walker) Melichar, 1912, Mon. Dictyophorinen, p. 11.

Taosa vitrata (Fabr.) = *viridifrons* Walker, Melichar 1912, op. cit. p. 153.

I have one specimen from Camory (Holmgren) very closely allied to *T. holmgreni* but with only a dark band across the base of the frons. This specimen agrees with Walker's type of *viridifrons*.

Melichar appears to have placed Walker's species into two places in his Monograph, as the above references show. In his table, defining the three species he recognized, *vitata* is stated to have "Flügel ohne Randfleck," but *viridifrons* has such a mark similar to the one in *holmgreni*. These two species are more closely allied to *T. suturalis* (Germ.) than to *T. vitata* (Fabr.) according to Melichar's table.

9. *Taosa sororcula* (Berg). New combination.

Dictyophora sororcula Berg, 1879, Hom. Argent. p. 219, 265.

This species belongs to this genus.

10. *Taosa rufa* sp. n. Fig. 7.

Female: Length 6.8 mm.; tegmen 8.4 mm.

Width of vertex 1.25 times the length; only a small portion of frons

visible from above. Frons longer than wide, length 1.4 times the width on apical half, base narrower than apex, the three carinae distinct, the bases of the medio-laterals swollen slightly.

Light reddish brown; the swollen portion of the base of the medio-lateral frontal carinae black; a small round black spot on the mesepimeron; dark fuscous over the posterior angle of mesonotum and postscutellum, a broad, dark fuscous mark down the middle of the abdominal dorsum, the anal style and apex of anal segment fuscous. Tegmina hyaline, the clavus and base of corium slightly reddish brown, the outer claval cell the darkest; veins reddish brown, the commissure and second claval vein the darkest; wings hyaline, slightly tinged with yellowish, veins light brown.

One female from Brazil, Parana (E. D. Jones). Type in British Museum.

11. *Taosa herbida* (Walker). New combination. Fig. 8:

Dichoptera herbida Walker, 1851, Cat. Hom. II, p. 306.

Four specimens from: Costa Rica, Matina; Brazil, Dumont St. Paulo and Piracicaba; Ecuador, Tena. The female specimen from Costa Rica is larger than the others and the female from Tena is reddish—the base of each of the medio-lateral carinae of frons is black.

12. *Taosa paraherbida* sp. n. Fig. 9.

Male: Length 10 mm.; tegmen 11 mm.

Length of vertex subequal to width at base, about one-half projecting in front of eyes, anterior margin strongly curved. The triangular area on each side is narrowly open. The three carinae on frons distinct. Genital styles longer than wide, ventral margin entire, nearly straight, dorsal margin slightly angular on basal half, the style gradually narrowing to the obtusely pointed apex, a small curved spine on dorsal margin near base; styles slightly longer than anal segment.

Green, slightly tinged with reddish brown. Tegmina and wings clear hyaline with green veins.

Female very slightly larger.

One male and two females from British Guiana, Blairmont (F. X. Williams, IX, X, 1923). Type in H. S. P. A. Experiment Station, Honolulu.

This differs from *T. herbida* in the shape of the vertex and in the absence of the two small black marks at base of frons.

Brachytaosa gen. nov.

The head and thorax of this genus are similar to those of *Taosa* but the carinae are obscure; the tegmina are very different, being short, diagonally truncate at apex, leathery, and broken up into innumerable small, irreg-

ular cells by irregular cross veins, the only portion free from these cells being the extreme base of corium.

The vertex separated from the frons by a transverse carina with a small triangular area where it meets the lateral carinae; an obscure median longitudinal carina; the carinae very obscure. Frons longer than wide, lateral margins slightly sinuate; three longitudinal carinae, the intermediates curving and meeting at the base; all very obscure. Clypeus tricarinate, the base projecting, rounding into apex of frons (clypeal suture arcuate). Pronotum short, the carinae very obscure; mesonotum short, obscurely tricarinate. Legs moderately long, simple, front tibiae only slightly longer than the femora. Hind tibiae with five to six spines on side, apex slightly expanded with a simple row of eight moderately large spines; hind basitarsus long, expanded at apex with an apical row of fifteen or sixteen minute spines, the outermost pair the largest, with a row of white flattened small hairs arising behind them; second tarsus fairly large, expanded apically with a similar row of spines and hairs to the basitarsus. Tegmina extending only slightly beyond the abdomen; apex obliquely truncate; claval veins forking about middle of clavus, entering commissure slightly before apex. Main veins obscured on account of the network of cross veins; Sc + R not forking or not before node; M forking a little before the apex of clavus, Cu somewhat basad of that, M arising from basal cell not joining Sc + R. Tegulae present.

1. *Brachytaosa venturii* sp. n. Fig. 10.

Female: Length 6.5 mm.; tegmen 6.5 mm.

In dorsal view a considerable portion of the base of the frons is visible, making the transverse carinae about the middle. Light brown; a dark brown mark at base of frons divided down the middle by the light median carina; the labium, apex and sides of clypeus, genae and the anterior lateral portion of pronotum (where it touches genae and eyes) dark brown; legs dark brown; femora with thin, longitudinal light lines; front and middle tibiae with a light band in the middle. Ventral surface of abdomen with small, dark brown spots. Tegmina leathery, brown with the veins yellow or light brown; much lighter in color at the base of clavus where the cross veins are missing, at node and on an indefinite mark from apex of clavus to apical angle. Wings hyaline, brown along the apical margin and distal portion of costal margin; veins light brown, showing up light in the brown portion.

Two female specimens from Argentina, Gob. Formosa (S. Venturi, I. 1898). Type in British Museum.

TROPIDUCHIDAE

Alcestis Stål

1. *Alcestis costalis* sp. n. Fig. 11.

Male: Length 5 mm.; tegmen 8 mm.

Vertex considerably broader than long, apex slightly rounded, base roundly emarginate, margins not thickened, median longitudinal carina very

obscure or missing; frons longer than wide, the median carina distinct, the apical curved portion of the anchor small; longitudinal median carina of clypeus obscure, no lateral carinae. The hind margin of the pronotum subangulately emarginate, the median carina very obscure. The three carinae of mesonotum distinct.

Tegmina broad, costal margin and apical margin round; the costa arising from the base, curving and recurving and reaching the costal margin considerably before the middle, the costal area fairly broad, short, with transverse veins (8). The Sc and R joined into a common stalk for a short distance, the Sc giving off four branches (the basal two bifurcate) which reach the costal margin; four Rs are on apical margin; five Ms, 1, 2, 3, 3a and 4. Cu 1 with three branches, Cu 1a with two. Clavus reaching beyond middle of tegmen; claval vein entering apex of clavus. A number of irregular cross veins.

Light stramineous; tegmina and wings hyaline, slightly yellowish, veins light yellow. All the cross veins in tegmina fuscous.

Pygofer laterally flattened, lateral margins slightly rounded. Anal segment longer than wide, widest slightly distad of anus, which is slightly before middle; slightly narrowed to apex which is roundly emarginate. The inner and apical margin of the genital styles rounded, the outer apical angle produced, a small curved spine on the outer margin near the base.

Hab. Brazil, Rio Autaz (A. Roman, August); one male specimen somewhat damaged.

2. *Alcestis romani* sp. n. Figs. 12, 13.

Male: Length 6 mm; tegmen 7 mm.

This species differs from *costalis* in having the median frontal carina more obscure, the Sc with only 5 veins entering costal margin and the R with three. In color the body is more reddish and the fewer cross veins in the tegmina very slightly fuscous.

The pygofer compressed laterally, the lateral margins slightly rounded. The anal segment long and narrow, apex narrow and subtruncate, anus about the middle. The genital styles long, narrow, shape as figured.

Hab. Brazil, Rio Autaz (A. Roman, September); one male specimen.

LOPHOPIDAE

Carrionia gen. nov.

This genus is near *Jivatma*; it differs in having no lateral carinae on the clypeus and its larger size. Its chief interest lies in the fact that it is the first species of Lophopidae to be reported from either North or South America. That it should be so closely related to a Malayan genus is difficult to understand. The costal area is small and does not reach so far as the apex of clavus; Sc + R forking near base, M and Cu forking about level, slightly distad of the middle of clavus; cross veins irregular, no nodal line or apical line.

1. *Carrionia flavicollis* sp. n.

Female: Length 11 mm.; tegmen 15 mm.

Length of vertex in middle 1.25 the width at base, slightly narrower at apex where it is divided from frons by an angular carina; a median carina which does not quite reach the apex. The length of frons subequal to width at widest portion, base narrowest, gradually widening to level with antennae though each side is angularly produced; the carinae on lateral margins not continued onto clypeus; median and medio-lateral carinae distinct, not quite reaching apex. Clypeus with a median carina but no laterals. Antennae small, second segment about as long as wide. Ocelli absent. Pronotum straight on the hind margin, tricarinate, the laterals converging together anteriorly, not reaching the hind margin; no shoulder carinae.

Mesonotum short, tricarinate. First and second tibiae and femora thin and expanded; front femora narrowest at base, gradually widening to the truncate apex; tibiae straight on inner margins, arcuate on outer; second legs similar to first but not quite so wide. Hind tibiae with three spines on the sides, apex with about eight apical spines, the outer two large, the rest small and irregular; hind basitarsus long, subparallel-sided, the apex not expanded, the apical spines irregular, forming a small pad; second tarsus small, without spines. The anal segment long, slightly curved, the apex expanded into a large bilobed plate secreting red powdery wax; the dorsal valvulae forming two semicircular plates, the inner and ventral valvulae small.

Head shiny black, the genae, beneath the eyes and the base of clypeus green; pronotum in the middle between the tegulae, shiny black on lateral portion; mesonotum dark brown; pleura, legs and abdomen (except genitalia) dark brown. Tegmina uniformly dark brown (the apices are broken); wings dark fuscous brown.

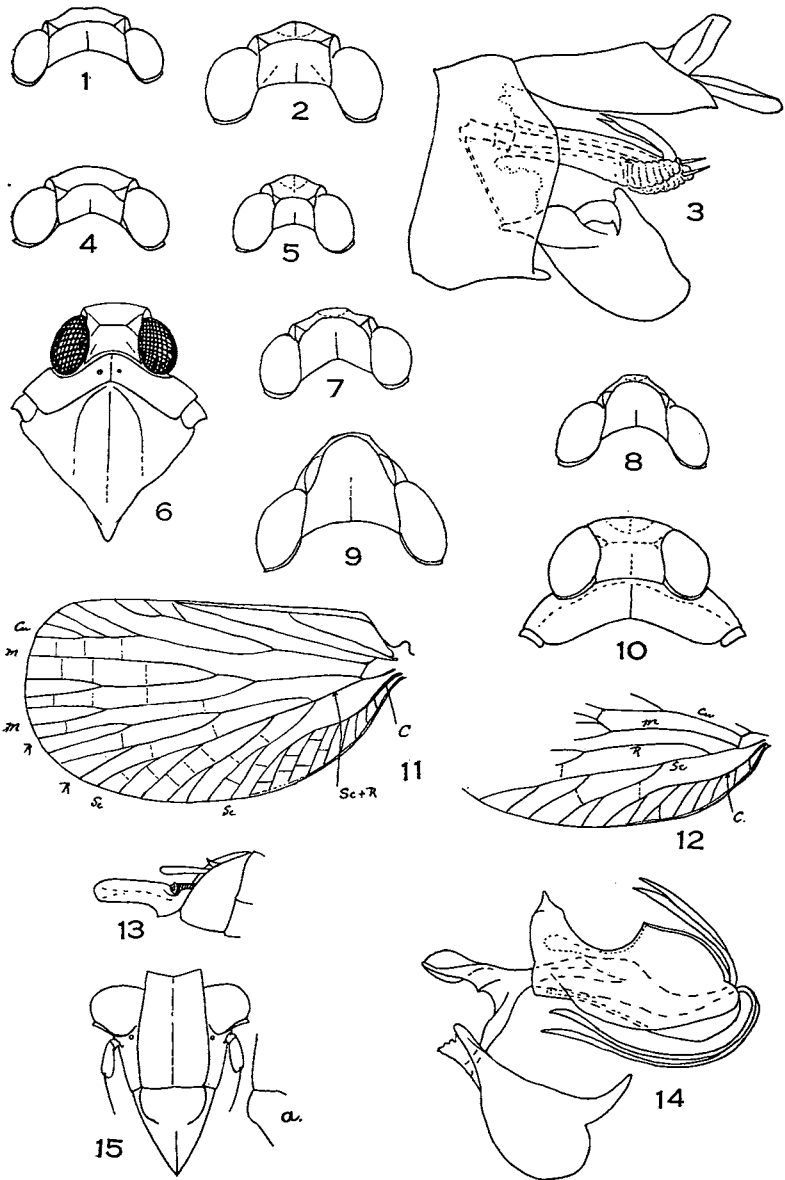
One female, Ecuador, Prov. Loja, Zamora (Prof. C. Carrion, July, 1925). Type in British Museum.

Hesticus Walker

This genus was placed by Melichar as doubtfully belonging to the Dictyophoridae. The male genitalia show that it does not belong to that family but to one of the Flatid-Ricaniid group of families. The hind tibiae have three spines on the side and nine or ten small ones at the apex, slightly irregular; the basitarsus fairly long and narrow with six small spines at apex and a couple near the apex; the second tarsus small, narrowly rounded at apex and without any spines. As there is no costal area and the frons is narrow and not angular, this genus must come into the Lophopidae. When we consider that this family contains some fairly diverse forms this should not appear strange. This makes the second genus of this family to be reported from South America.

EXPLANATION OF FIGURES, PLATE X

1. *Taosa viridis*—dorsal view of head.
2. *Taosa bimaculifrons*—dorsal view of head.
3. *Taosa bimaculifrons*—lateral view of male genitalia, the membrane not fully expanded.
4. *Taosa lineatifrons*—dorsal view of head.
5. *Taosa holmgreni*—dorsal view of head.
6. *Taosa viridifrons*—dorsal view of head and thorax.
7. *Taosa rufa*—dorsal view of head.
8. *Taosa herbida*—dorsal view of head.
9. *Taosa paraherbida*—dorsal view of head.
10. *Brachytaosa venturii*—dorsal view of head and pronotum.
11. *Alcestis costalis*—right tegmen.
12. *Alcestis romani*—right tegmen, costal portion.
13. *Alcestis romani*—lateral view of male genitalia.
14. *Hesticus pictus*—lateral view of aedeagus and genital style.
15. *Hesticus sanguinifrons*—front view of head; (a) outline of base of clypeus.



South American Fulgoroidea.

1. *Hesticus pictus* (Walker). Fig. 14

One male from City of Rio de Janeiro (F. X. Williams, I, 1924). This is darker than the type and has the base of the clypeus black, but one can see red at the margins of the black. I consider it the same species. The aedeagus and genital styles figured; the type conforms to that of the Lophopidae. The anal segment is large, the lateral margins of the apical half being expanded and turned ventrad.

2. *Hesticus rufimanus* (Walker). New combination.

Cladodiptera rufimanus Walker, 1858, Cat. Hom. Suppl. p. 77.

I consider this to belong to *Hesticus*. The lateral carinae of the clypeus are considerably raised; the vertex is narrower and longer and the V carina across the vertex a little nearer to the apex.

One female from Brazil, Rio Autaz (A. Roman).

3. *Hesticus sanguinifrons* sp. n. Fig. 15, 15a.

Female: Length 8 mm.; tegmen 11 mm.

This species is typical of the genus; the front legs are not quite so wide as in *H. pictus*. It is near to *H. rufimanus* but the lateral carinae of clypeus are not quite so prominent.

The width of vertex slightly greater than the length in middle; the angular transverse carina near apex; the lateral margins subparallel, with elevated carinae, base angularly emarginate. Length of frons 1.5 the width; the lateral margins slightly sinuate, slightly widest on apical half, a fine carina down the middle; clypeus with the lateral carinae elevated and curved; first segment of antennae wider than long, second segment about twice as long as broad. Front femora flattened, expanded, widest at apex, gradually narrowing to base, length 3.5 times the width at apex, front tibiae flattened, expanded, inner edge straight, outer curved, length 4.4 times the width, a keel running down the middle of anterior surface; middle legs flattened but not expanded; hind tibiae with three spines on side on apical half, the first in middle, apex slightly widened with about nine spines forming an irregular row; hind basitarsus long, thin, six or seven minute spines at the truncate apex forming a regular row; second tarsus small, apex pointed or narrowly rounded, without spines.

Yellow; a blood red mark down the middle of frons and clypeus; the median carina of mesonotum slightly red; front legs reddish; the apex of femora and tibiae brownish; hind femora fuscous. Abdomen reddish brown with darker mottling, especially along the lateral portion of the dorsum.

Tegmina and wings clear hyaline with brown veins; in the tegmina these are darkest in the membrane; stigma reddish brown; a small fuscous mark on apical margin at apex of Rs.

One female from Tena, Ecuador (F. X. Williams, III, 1923).