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NOTES ON THE FLATID GENUS *ORMENIS* IN THE BRITISH
LESSER ANTILLES AND TRINIDAD, WITH DESCRIPTIONS OF
NEW SPECIES (HOMOPTERA: FULGOROIDEA).

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This paper includes observations on the genus *Ormenis* made in the islands of Montserrat, Dominica, St. Lucia, St. Vincent, Barbados, Grenada, and Trinidad during the last three years, together with descriptions of material collected in the above islands and in St. Kitts and Antigua.

In general the volcanic islands of the Lesser Antilles were originally well wooded, having a low moss-forest on the highest peaks, high forest on the mountain slopes down to about 800 feet above sea level, then passing through a drier zone of mesophytic vegetation to the dry "crotoneta" bush association of the coastal area.

The various species of *Ormenis*, though often found on certain host plants in great numbers, are in fact very general feeders on shrubs or rather woody herbs. Each species, however, is usually restricted to a dry association or to a wet association, a frequenter of the "crotoneta," for instance, never occurring in the high forest. In addition to this segregation of species within islands, species differ between islands, and in the southern half of the Lesser Antillean archipelago a high degree of endemism is found. The importance of these facts, from the systematic standpoint, is that considerable weight can be attached to locality labels as corroborative evidence of correct determination of species. This, however, applies only to a limited extent with regard to Trinidad, which faunistically has strong affinities with the mainland of South America.

The characters which have proved to be most reliable in differentiating between species or groups of species are the form of the genitalia (especially of the male), and the occurrence and position of dark ("black") spots or areas on the tegmen. The latter, however, is not entirely reliable, as in at least two species dimorphic forms occur (a dark and a pale form) and this is apt to

cause confusion, especially when only females are available for study. The shape of the egg has some slight systemic value and is stated where known.

There appears to be little in common between the Trinidad species so far examined apart from the shape of the female genitalia and the possession of two post-tibial spines, but the Lesser Antillean species fall into convenient groups, one of which, the *contaminata* group is very compact. The groups are typified as follows:

- (1) Male genital styles excavated on dorsal margin before apex; anal segment with median ventral process; female genital styles small, devoid of tooth-like processes; egg approximately rectangular, pointed at one end, operculate.....*contaminata* group.
- (2) Male genital styles variable; anal segment of female very long, genital styles small, devoid of tooth-like processes; egg ovoid, not operculate.....*marginata* group.
- (3) Male genital styles not excavated on dorsal margin before apex, apical process spinose or peg-like; anal segment without median ventral process; female anal segment short, genital styles large and thick with tooth-like processes on apical margin; egg ovoid, not operculate.....*plumbea* group.

The distribution of these groups, as far as the writer is aware, is as follows. The *contaminata* group is represented in Montserrat, Dominica, St. Lucia, St. Vincent, Barbados, and Grenada; the *marginata* group in St. Kitts, Antigua, Montserrat, and St. Lucia, while from records it appears to extend to Puerto Rico. The *plumbea* group, into which the Trinidad species fall, has species in Dominica, St. Lucia, and Trinidad.

The separation of species on superficial characters is not easy (except, perhaps, when geographical distribution is used as additional data) and the following key, which does not necessarily indicate the natural grouping of species, and which fails to differentiate morphologically between dark females of two species, is offered for what convenience it may afford to students of the genus.

KEY TO THE SPECIES OF *Ormenis* IN THE LESSER ANTILLES AND TRINIDAD.

- (1)(2) Anal segment of male with median ventral process; genital styles excavated on dorsal margin before apex. Anal segment of female not twice length of genital styles, latter devoid of tooth-like spines on apical margin.....*contaminata* group (21)
- (2)(1) Male and female genitalia not as above.....(3)
- (3)(4) Genital styles of male with two points on apical process. Anal segment of female nearly four times as long as genital styles, latter devoid of tooth-like spines on apical margin. Tegmina with seven dark spots.....*septempunctata*.

- (4)(3) Genital styles of male with apical process simple; anal segment of female long or short.....(5)
- (5)(8) Anal segment of male with a downward process half way along each lateral margin; female with anal segment three times length of genital styles, or if short, tegmen green with one dark spot.....(6)
- (6)(7) Tegmen pale green, with a dark spot at apex of clavus. Female genital styles toothed.....*unimaculata*.
- (7)(6) Tegmen dark, with a white submarginal line, or green bordered orange on apical margin. Female genital styles devoid of tooth-like processes.....*marginata*.
- (8)(5) Anal segment of male with no processes; genital style with apical process a long spine. Female with short, bluntly rounded anal segment, and genital styles with tooth-like processes on apical margin.....(9)
- (9)(12) Tegmina pale yellow, speckled black, or wholly black or smoky.....(10)
- (10)(11) Tegmina pale yellow speckled with black.....*nigrospersa*.
- (11)(10) Tegmina wholly black or smoky.....*fuliginosa*.
- (12)(9) Tegmina not as above.....(13)
- (13)(16) Tegmina brown or red-brown.....(14)
- (14)(15) Tegmina dull brown, two clear spots near middle.....*fortunata*.
- (15)(14) Tegmina generally red-brown, species 1½ cm. long.....*rufa*.
- (16)(13) Tegmina black with costal area white, or tegmina wholly pale green.....(17)
- (17)(18) Tegmina black or leaden with costal area white.....*plumbea*.
- (18)(17) Tegmina pale green.....(19)
- (19)(20) Hind tibia with one spine before apex.....*silvestris*.
- (20)(19) Hind tibia with two spines before apex.....*plumbea*.
- (21)(24) Tegmina very dark, costa pale, species not from St. Lucia.....(22)
- (22)(23) Tegmen 6 to 7 mm. long.....*albicostalis*.
- (23)(22) Tegmen 8 to 9 mm. long.....*palicoureae*.
- (24)(21) Tegmina not dark, or if so, species from St. Lucia.....(25)
- (25)(28) Tegmina with a dark line overlying Sc and base of C.....(26)
- (26)(27) A large black spot, bordered white, on anterodorsal margin of eye; costa dusky throughout length.....*barbadensis*.
- (27)(26) No such spot; costa pale except at base.....*santaliciensis*.
- (28)(25) Tegmina tawny, with no dark line overlying Sc.....(29)
- (29)(30) Tegmina with no dark area at base.....*contaminata*.
- (30)(29) Tegmina with a dark area at base.....*grenadensis*.

ORMENIS Stål.

1862. *Ormenis* Stål, Rio Janeiro Hemipt., pp. 68, 69.
Genotype, *P. rufo-terminata* Stål.

Ormenis marginata Brunnich (pygmaea Fabricius).

1767. *Cicada marginata* Brunnich in Linné Syst. Nat., i (2) p. 710.

1902. *Ormenis* (*Petrusa*) *marginata* Melichar, Ann. Natur. Mus. Wien, xvii, p. 96.
 1914. *Petrusina marginata* Melichar, Gen. Ins., Fasc. 182, p. 75.
 1923. *Ormenis marginata* Wolcott, In. Port., Jour. Dept. Agr. P. R., vii, p. 271.
 1929. *Ormenis marginata* Osborn, Jour. Dept. Agr. P. R., xiii, p. 109.
 1935. *Ormenis marginata* Osborn, Sci. Survey P. R. and Virg. Is., N. Y. Acad. Sci. xiv, p. 221.
 1794. *Cicada pygmaea* Fabricius Ent. Syst., iv, p. 30.
 1869. *Petrusa pygmaea* Stål, Hemipt. Fabriciana, ii, p. 112.
 1902. *Ormenis pygmaea* Melichar, Ann. Nat. Mus. Wien, xvii, p. 96.
 1914. *Petrusa pygmaea* Melichar, Gen. Ins., Fasc. 182, p. 75.
 1923. *Ormenis pygmaea* Wolcott, Ins. Port., Jour. Dept. Agr. P. R., xvii, p. 271.
 1929. *Ormenis pygmaea* Osborn, Jour. Dept. Agr. P. R., xiii, p. 109.
 1935. *Ormenis* (*Petrusa*) *pygmaea* Osborn, Sci. Survey P. R. and Virg. Is., N. Y. Acad. Sci. xiv, pt. 2, p. 220.

This somewhat confusing species is here redescribed to define the limits of its variability.

Male.—Length, 4.8 mm.; tegmen, 5.6 mm. *Female*. Length, 4.8 mm.; tegmen, 5.5 mm. Frons as broad as long, median carina distinct on basal two thirds, only slightly indicated on basal third, lateral carinae indicated at base, lateral margins carinate; no carinae on clypeus; vertex very short; head (with eyes) as wide as thorax; pronotum smooth, no carinae on mesonotum. Hind tibia with only one spine before apex. Costal area granulate, strongly so basally, Sc simple to apex, R, M, and Cu forking at about the same level. Base of R and M granulate. Nodal line parallel to outer margin of tegmen, marked by irregular cross-veins and a depression from the node to near apex of clavus; apical line even and distinct. Basal two thirds of clavus strongly granulate.

Dark form (*marginata* of earlier writers): pronotum fuscous, laterally orange or yellow, mesonotum fuscous near middle line, two pale areas on anterior margin, and two pale spots near posterior margin, two pale lines in position of lateral carinae, remainder fuscous, darker near tegulae; vertex very dark, frons and clypeus very pale yellow; genae pale yellow, antennae and a spot below eyes orange, eyes dark purplish red. Legs pale yellow. Abdominal tergites and genitalia fuscous, sternites and pygofer pale. Tegmina fuscous, a white band between C and Sc to apex, slightly overlapping costal area, a trace of white on veins along nodal line. Wings smoky, veins slightly darker. Insect in life powdered pale grey or leaden grey.

Pale form (*pygmaea* of earlier writers): head, thorax and legs very pale yellow, eyes red; tegmina pale greenish yellow, veins beyond nodal line and membrane pale orange, wings transparent. Insect in life powdered white, appearing whitish green.

There are many intergrades between these two types.

Anal segment of male with a process half way along each lateral margin curving ventrally and anteriorly; apical portion of segment not strongly deflexed. Genital styles with L-shaped apical process, bluntly curved anteriorly at tip.

Aedeagus with two pairs of dorsal processes at apex, the larger half the length of the aedeagus, the smaller two thirds the length of the larger; a pair of lateral processes on dorsal border behind apex, each process terminating in a cone-like point, or in two points, the posterior often more prolonged, and ventrally in a short spine directed anteriorly. Anal segment of female long (1.0 mm.), genital styles small, devoid of tooth-like apical processes. Egg ovoid, smooth.

Redescribed from 38 males and 13 females of the dark form and 33 males and 50 females of the pale form collected by the writer at Ile's Bay (Dec. 30, 1938), Woodlands Estate (Dec. 30, 1938), Foxes Bay (Dec. 31, 1938) and Plymouth (Feb. 22, 1940) Montserrat, B. W. I. on *Lantana camara* and *L. involucrata*, and from material in the writer's possession from St. Kitts (Aug. 2, 1940) and Antigua (Oct. 20, 1938). The species, as noted by Mr. Oman, is dimorphic, and intergrades, though common, are few in comparison with either of the main colour forms, which occur together in nature. The species is not closely related to any other Lesser Antillean species. Material from Montserrat has been deposited in the U. S. National Museum.

Ormenis albicostalis, n. sp.

Male.—Length, 5.7 mm.; tegmen, 6.4 mm. *Female*. Length, 5.9 mm.; tegmen, 7.2 mm. Frons broader than long (1.5 to 1), median carina distinct on basal half, absent from apical half, lateral carinae only indicated at base, lateral margins carinate; no carinae on clypeus; vertex very short; width of head (with eyes) equal to width of thorax; pronotum with a depression apically on each side of middle line, and a median depression basally; mesonotum without carinae, or median carina slightly indicated at apex. Hind tibia with two spines before apex. Costal area slightly granulate, Sc strong, simple to apex; R arising from M near its base and forking about one third from base of tegmen, M forking basad of R fork, Cu forking slightly basad of M fork. Base of R and M granulate. Nodal line parallel to apical margin, poorly defined by irregular cross-veins and a depression from middle of tegmen to near apex of clavus; apical line fairly even and distinct; clavus granulate on basal two thirds.

Pronotum testaceous, mesonotum fuscous, with a paler line on each side of middle line, frons pale yellow, carinae fuscous; clypeus pale yellow, genae pale yellow, antennae light fuscous, eyes red or red-brown. Front and middle legs pale, hind legs light fuscous, paler towards tarsi; abdomen and genitalia fuscous. Tegmen usually very dark fuscous, costal area pale yellow, only narrowly so at base; veins near node pale yellow, a narrow transparent area in middle of tegmen along nodal line. Tegmen sometimes light fuscous, a dark area over base of C and a dark line between Sc and R. Wings smoky, veins dark.

Anal segment of male with ventral process medially, slightly recurved; deflexed part of segment about equal in length to horizontal part. Genital style with dorsal margin excavated before apex, apical process a short twisted peg. Aedeagus with two long spines at apex dorsally, directed anteriorly for

two-thirds length of aedeagus, and ventrally a pair of stouter processes, sometimes curved like a sickle, sometimes like a fish-hook.

Anal segment of female short, bluntly rounded; genital styles small. Devoid of tooth-like processes on apical margin. Egg approximately rectangular, pointed at one end, operculate.

Described from 5 males and 7 females collected by the writer near Plymouth, Montserrat, B. W. I. (Jan. 19, 1939) on *Lantana involucrata* and *Caesalpinia* sp. Type material in the U. S. National Museum, Washington.

This species is a member of the *contaminata* group.

Ormenis septempunctata, n. sp.

Male.—Length, 4.7 mm.; tegmen, 5.3 mm. *Female*. Length, 4.2 mm.; tegmen, 5.7 mm. Frons broader than long (1.5 to 1), median carina distinct on basal two thirds, absent from apical third, lateral carinae scarcely indicated at base, lateral margins carinate; no carinae on clypeus; vertex very short; width of head (with eyes) equal to width of thorax. Pronotum with a slight depression anteriorly on each side of middle line; no carinae on mesonotum, or median carina slightly indicated at apex, lateral carinae at base. Hind tibia with two spines before apex. Costal area slightly granulate. Sc simple to apex, R forking about one third from base of tegmen, and M forking about same level, Cu forking slightly basad of former two. Base of R and M granulate. Nodal line indicated by irregular cross-veins, well defined in middle; apical line even and distinct. Clavus heavily granulate over basal two thirds.

Pronotum and mesonotum pale testaceous; mesonotum with a long triangular outer spot and a small round inner spot on each side basally. Frons light yellowish-brown, clypeus yellow; genae and antennae yellow, eyes purple. Legs very pale yellow. Abdominal tergites fuscous, sternites pale; genitalia testaceous to deep fuscous. Tegmina stramineous to fuscous, a small dark spot at base of costal area; a small trapezoidal spot at base of radius; an elongated spot (3.5 to 1) between M and Cu basally; a larger semicircular spot distad of this; a small intense spot at apex of clavus; two irregular spots occupying two or three cells near the anterior and posterior ends of nodal line. Apical line and veins distad of it often margined with fuscous, more intense posteriorly. Wings clear or slightly fuscous, veins a little darker. Insect in life powdered a pale fawn, relieved only by the dark spots.

Anal segment of male devoid of ventral process; deflexed part of segment one third of length of horizontal part. Aedeagus with a pair of hooks at apex ventrally recurved anteriorly; arising at same level two ventral processes recurved anteriorly almost as long as aedeagus; a small projection directed outwards distad of centre of aedeagus. Genital styles with apical process broad, a larger prong basally, directed outward, a smaller prong apically directed posteriorly.

Anal segment of female very long (1.4 mm.); genital styles small, rounded, devoid of tooth-like apical processes. Egg ovoid.

Described from 19 males and 16 females collected by the

writer at Ile's Bay, Montserrat, B. W. I. (Jan. 7, 1939) on *Coccoloba uvifera*. Type material is in the U. S. National Museum, Washington.

Ormenis sanctaliciensis, n. sp.

Male.—Length, 6.3 mm.; tegmen, 6.7 mm. *Female*. Length 6.4 mm.; tegmen, 6.8 mm. Frons broader than long (1.3 to 1), median carina distinct on basal half, absent from apical half, lateral carinae indicated at base, lateral margins carinate; no carinae on clypeus; vertex short. Width of head (with eyes) equal to width of thorax; a slight median ridge on the pronotum anteriorly, and a small depression on each side of it; mesonotum with median carina indicated at apex, lateral carinae at base. Hind tibia with two spines before apex. Costal area slightly granulate, Sc strong, simple to apex, R arising from M near its base, forking one third from base of tegmen, M forking basad of R fork, Cu forking at same level as M. Base of R and M granulate. Nodal line parallel to outer margin of tegmen, poorly marked by irregular cross veins and an antero-posterior depression along a line from node to apex of clavus; apical line even and distinct. Basal two thirds of clavus strongly granulate.

Pronotum testaceous or fuscous, mesonotum pale or dark fuscous, frons testaceous or pale, clypeus fuscous with a pale yellow line each side of middle, curving inward basally; genae and antennae yellow, eyes red, sometimes suffused with dark brown in anterior half. Legs pale testaceous. Abdominal tergites fuscous, sternites paler; genitalia fuscous or very dark. Tegmina tawny, sometimes dark brown, a broad very dark band overlying costa at its base, and lying between Sc and R to apex; veins beyond apical line fuscous, membrane smoky; base of clavus fuscous to fuliginous. Wings pale with veins apically fuscous, or smoky with veins dark. Insect in life powdered pale fawn, pearly grey, or pale green, according to ground colour.

Anal segment of male with a short median ventral process; deflexed part of segment only slightly shorter than horizontal part; aedeagus with a pair of dorsal apical spines less than half as long as aedeagus, and ventrally a pair of curved processes, short and twisted, each ending in a small hook. Genital styles with dorsal margin excavated before apex; apical process a blunt peg directed upwards.

Anal segment of female only a little longer than the genital styles, bluntly rounded; genital styles small, rounded, and devoid of tooth-like processes on apical margin. Egg approximately rectangular, pointed at one end, operculate.

Described from 42 males and 54 females taken at Castries (Nov. 30, 1938), Choiseul (May 14, 1939), and Soufriere (Feb. 2, 1939) St. Lucia, B. W. I., on *Lantana involucrata*, mango, limes, *Coccoloba uvifera*, and many wayside bushes. This species which is endemic, as far as is known, is well separated from its counterparts of the *contaminata* group in other islands by the shape of the ventral processes of the aedeagus. Type material in U. S. N. M., Washington.

Ormenis fortunata, n. sp.

Male.—Length, 5.9 mm.; tegmen, 7.9 mm. *Female*. Length, 6.4 mm.; tegmen, 8.0 mm. Frons broader than long (1.3 to 1), median carina distinct on basal two thirds, absent or only indicated on apical third, lateral carinae absent, lateral margins carinate; no carinae on clypeus; vertex very short. Width of head (with eyes) equal to width of thorax. Pronotum with a depression anteriorly on each side of middle line; mesonotum with median carina present, or at least indicated, at base; and indicated at apex; lateral carinae slightly indicated at base. Hind tibia with two spines before apex. Costal area slightly granulate, Sc strong, simple to apex; R arising from M near its base, forking slightly basad of middle of tegmen, M forking at about basal third of tegmen, Cu forking at approximately same level. Base of R granulate. Nodal line parallel to outer margin of tegmen, even and distinct, produced distally before turning basad to apex of clavus; apical line fairly even and distinct; basal half of clavus strongly granulate.

Pronotum light fuscous, mesonotum dark fuscous, middle line testaceous anteriorly, frons testaceous, clypeus and genae stramineous, antennae pale with a dark spot dorsally, eyes red. Front and middle legs yellow, hind legs pale fuscous. Abdominal sclerites and anal segment dark or light fuscous, genitalia light fuscous. Tegmina evenly fuscous, veins of costal area and distad of nodal line concolorous, remainder dark fuscous. Two areas of tegmen transparent, a drop-shaped area between middle of tegmen and base of Cu, and a bluntly oval area anterior to middle of tegmen close to nodal line; a dark area in middle of clavus. Wings smoky, veins very dark. Insect in life powdered greyish-brown, a pale spot on middle of tegmen, a black spot on clavus.

Anal segment of male thin, bluntly rounded, distally only slightly deflexed, and devoid of ventral processes. Aedeagus with two sclerotized knob-like processes apically; ventrally, arising near apex, a pair of curved processes equal to half length of aedeagus, curving moderately upwards; at the origin of these processes a transparent spine one-sixth length of the process. Genital styles expanding in width apically; apical process a long spine recurved at tip.

Anal segment of female bluntly rounded, genital styles broad and thick, bordered apically with tooth-like spines. Egg sub-rectangular, tapering towards one end, beset heavily with chorionic processes on one side.

Described from 5 males and 5 females collected at 700 ft. on Morne Fortunée, St. Lucia, B. W. I., by the writer (Feb. 2, 1940) on *Psidium guajava*. Type material in the U. S. National Museum, Washington.

The species is considered endemic, and in the characters of the male genitalia and of the egg appears to occupy an isolated position.

Ormenis plumbea, n. sp.

Male.—Length, 5.6 mm.; tegmen, 6.5 mm. *Female*. Length, 5.7 mm.; tegmen, 7.2 mm. Frons only a little broader than long (1.2 to 1), median carina distinct on basal three-quarters, absent from apical quarter, lateral carinae only

indicated on basal third, lateral margins carinate; no carinae on clypeus; vertex very short. Width of head (with eyes) equal to width of thorax. Pronotum with a circular depression anteriorly on each side of middle line; mesonotum without carinae, or only an indication at base of lateral carinae. Hind tibia with two spines before apex. Costal area slightly granulate, Sc strong, simple to apex, R arising from M at its base, and forking about one quarter from base of tegmen, M forking basad of R fork, Cu forking at same level as M. Base of R and M granulate. Nodal line parallel to outer margin of tegmen, marked by irregular cross-veins and a slight depression from middle of apical quarter of tegmen to near apex of clavus; apical line fairly even and distinct. Basal three-quarters of clavus strongly granulate.

Dark form: pronotum fuscous, mesonotum fuscous with pale lines below position of lateral carinae, frons testaceous, clypeus pale yellow, darker medially towards apex, genae and antennae pale yellow, eyes dark red. Legs pale yellow, tarsi testaceous. Abdominal tergites and anal segment fuscous, sternites pale yellow, testaceous, or fuscous. Tegmina black or very dark fuscous, a pale line along costal area, narrowing in basal third, veins paler in depression along nodal line; wings smoky, veins concolorous or very dark. Insect in life powdered a uniform leaden or blue-grey colour.

Pale form: head, thorax, legs, abdomen and genitalia a transparent whitish green; tegmina pale whitish green with a narrow black line along commissural margin; wings milky.

Anal segment of male devoid of median ventral process; deflexed part of segment equal to, or slightly longer than, horizontal part; aedeagus with two short straight spines projecting antero-dorsally at apex, laterally a shallowly-curved process, with the pointed tip sometimes markedly turned dorsally; genital styles expanding in width apically, apical process a long spine curving anteriorly.

Anal segment of female bluntly rounded; genital styles broad, thick, bordered on apical margin with tooth-like processes.

Described from 33 males and 42 females collected at 1,000 ft. in mountain forest near Quillesse, St. Lucia, B. W. I., by the writer (Mar. 20, 1939) on *Miconia* sp. and *Piper* sp. The species is considered endemic, and is separated from allied forms by the short spinose dorsal processes of the aedeagus. No intergrades between the dark and pale form have been found. Type material in the U. S. National Museum, Washington.

Ormenis silvestris, n. sp.

Male.—Length, 4.8 mm.; tegmen, 5.6 mm. *Female*. Length, 4.8 mm.; tegmen, 6.5 mm. Frons only slightly broader than long (1.1 to 1), median carina distinct on basal two thirds, absent from basal third, lateral carinae absent, lateral margins carinate; no carinae on clypeus; vertex very short. Width of head (with eyes) rather less than width of thorax. Pronotum with a slight depression each side of middle line anteriorly; mesonotum without carinae, or lateral carinae only indicated at base. Hind tibia with only one spine before

apex. Costal area slightly granulate, Sc strong, simple to apex, R arising from M at its base forking about one third from base of tegmen, M forking markedly basad of this, and Cu forking still further basad. Base of R and M granulate. Nodal line parallel to apical margin and poorly marked with irregular cross-veins; apical line distinct and even. Clavus strongly granulate.

Pronotum, frons, genae and antennae pale stramineous, eyes dark red; clypeus, mesonotum, legs, and abdomen light yellow, pregenital sternite edged with black, genitalia stramineous and red-brown. Tegmina transparent, very rarely faintly smoky between C and Sc along basal third of tegmen; wings transparent. Insect in life powdered white, and appearing greenish-white.

Anal segment of male with no ventral process; deflexed apical part of segment about as long as horizontal part. Aedeagus with a pair of dorsal spines at apex directed anteriorly for slightly less than half length of aedeagus; two stout ventro-lateral processes shallowly curved upwards; genital styles expanding in width apically, apical process a long spine curving anteriorly.

Anal segment of female rather short, bluntly rounded; genital styles broad and thick, bordered with tooth-like processes on apical margin. Egg ovoid, smooth.

Described from 18 males and 9 females collected at 800 ft. in mountain forest near Mahaut, Dominica, B. W. I., by the writer (June 14, 1939) on *Palicourea crocea*, *Phyllanthus* sp., and *Piper* sp. Type material in U. S. National Museum, Washington. This species is interesting in having no dark form, and not corresponding to any dark form in other islands. It is separated from the pale form of *O. plumbea*, its St. Lucian counterpart, by the single posttibial spine, and by the length and shape of the dorsal processes of the aedeagus.

Ormenis palicoureae, n. sp.

Male.—Length, 7.2 mm.; tegmen, 8.1 mm. *Female*. Length, 6.8 mm.; tegmen, 8.9 mm. Frons broader than long (1.3 to 1), median carina distinct on basal half, absent from apical half, lateral carinae only indicated at base, lateral margins carinate; no carinae on clypeus; vertex very short. Width of head (with eyes) equal to width of thorax. Pronotum with a small depression anteriorly on each side of middle line; mesonotum with median carina only indicated at apex, lateral carinae at base. Hind tibia with two spines before apex. Costal area slightly granulate, Sc strong, simple to apex, R arising from M near its base, forking about one third from base of tegmen, M forking basad of R fork, Cu forking still further basad. Base of R and M granulate. Nodal line parallel to apical margin, indicated by a depression from node to near apex of clavus; apical line even and distinct. Clavus strongly granulate on basal two thirds.

Pronotum fuscous, mesonotum dark fuscous, frons and clypeus light fuscous, genae and antennae light fuscous, pale below eyes and antennae, eyes red; front and middle legs testaceous tinged with fuscous, hind legs light fuscous; abdominal tergites and genitalia fuscous, sternites lighter. Tegmina black or

fuliginous, a pale yellow line along costal margin, very narrow in basal third of tegmen, then covering costal area to node; veins near node pale, membrane smoky, veins concolorous, nodal line pale. Wings smoky, veins very dark. Insect in life powdered a dusky blue.

Anal segment of male with a large ventral median process, with a transparent flange projecting distally from its middle line in a broad arc; deflexed part of segment shorter than horizontal part; aedeagus with a pair of spines arising from apex and directed anteriorly for almost half the length of aedeagus; a pair of strongly recurved processes ventro-laterally; genital styles with dorsal margin deeply excavated before apex, apical process twisted, with a sinuate outline laterally.

Anal segment of female broad and bluntly rounded; genital styles small, oval, devoid of tooth-like processes on apical margin. Egg approximately rectangular, pointed at one end, operculate.

Described from 4 males and 10 females collected at 800 ft. in mountain forest near Mahaut, Dominica, B. W. I., by the writer (June 14, 1939) on *Palicourea crocea*. Type material in U. S. National Museum, Washington. This species is a forest dweller, and is endemic in Dominica, as far as is known. It is separated from other dark members of the *contaminata* group by its size and by the shape of the male genitalia. No pale form of this species has been found.

Ormenis barbadensis, n. sp.

Male.—Length, 4.8 mm.; tegmen, 5.5 mm. *Female*. Length 5.0 mm.; tegmen, 6.1 mm. Frons broader than long (1.4 to 1), median carina distinct on basal half, absent from apical half, lateral carinae present, but not well marked, lateral margins carinate; no carinae on clypeus; vertex very short. Width of head (with eyes) equal to width of thorax. Pronotum with a small depression on each side of middle line anteriorly; mesonotum with no carinae, or median carina only indicated apically. Hind tibia with two spines before apex. Costal area slightly granulate, Sc very strong, simple to apex, R arising from M near its base, forking about one third from base of tegmen, M forking distinctly basad of R fork, Cu forking at same level as M. Base of R and M granulate. Nodal line parallel to apical margin, feebly indicated by an elongated depression from node to near apex of clavus; apical line fairly even and distinct; clavus strongly granulate on basal two thirds.

Pronotum testaceous or fuscous, dark on posterior margin, mesonotum orange or fuscous, frons dark testaceous, clypeus testaceous, genae and antennae pale or testaceous, eyes red, a black spot on antero-dorsal margin, bounded with white; legs pale yellow; abdominal tergites, anal segment and genitalia fuscous, sternites paler. Tegmina pale tawny, costal area very pale yellow as far as node, costa usually narrowly fuscous; a black or dark fuscous line between Sc and R; tegmen shading distally from middle into fuliginous; veins of apical area concolorous, depression of nodal line transparent; base of clavus fuliginous. Wings pale or smoky, veins darker. Insect in life powdered pale fawn or grey.

Anal segment of male with a median ventral process curved anteriorly; apical part of segment strongly deflexed and almost equal in length to horizontal part; aedeagus with a pair of dorsal spines apically directed anteriorly for half length of aedeagus; ventrally a pair of thin processes more than two thirds length of aedeagus, greatly recurved and sometimes crossing apically; genital styles broad with dorsal border excavated before apex; apical process blunt, peg-like, twisted at tip.

Anal segment of female short, bluntly rounded; genital styles rounded, small, devoid of tooth-like processes on apical margin. Egg approximately rectangular, pointed at one end, operculate.

Described from 16 males and 7 females collected by the writer at St. Lawrence Gap, Barbados, B. W. I. (Mar. 30, 1941), feeding on *Coccoloba uvifera*. This member of the *contaminata* group is separated from *contaminata* and *grenadensis* by the pattern of the tegmina, and from *sanctaliciensis* by the long ventral processes of the aedeagus, and, less easily, by the narrowly fuscous costa. Type material in U. S. N. M., Washington.

Ormenis contaminata Uhler.

1895. *Ormenis contaminata*. Uhler Proc. Zool. Soc. London.

As Uhler at the conclusion of his description noted that he did not find any important differences to separate *O. contaminata* from a species ranging between Northern Mexico and the Southern United States, the following redescription is offered with additional characters to define the species more closely.

Male.—Length, 5.2 mm.; tegmen, 6.4 mm. *Female*. Length, 5.2 mm.; tegmen 6.7 mm. Frons broader than long (1.3 to 1), median carina distinct on basal half, absent from apical half, lateral carinae not even indicated, lateral margins carinate; no carinae on clypeus; vertex very short. Width of head (with eyes) equal to or slightly wider than thorax. Pronotum with a depression anteriorly on each side of middle line; mesonotum with no carinae, or lateral carinae slightly indicated at base. Hind tibia with two spines before apex. Costal area slightly granulate, Sc strong, simple to apex, R forking about one third from base of tegmen, M forking basad of R fork, Cu forking slightly distad of M fork. Base of R and M granulate. Nodal line marked anteriorly by cross-veins, posteriorly by an elongated depression along a curved line from node to apex of clavus; apical line fairly even and distinct. Clavus strongly granulate in basal two thirds.

Pronotum fuscous, paler near anterior edge; mesonotum lighter fuscous; frons, clypeus, genae and antennae pale yellow, eyes orange-red, a black spot bordered white antero-dorsally. Legs testaceous; abdominal tergites and anal segment fuscous, sometimes green, sternites paler, genitalia testaceous. Tegmina pale tawny, veins yellow, membrane beyond apical line fuliginous, veins concolorous, a dark area in posterior half of tegmen between middle and apical line, traversed by pale veins. This dark area may involve the distal half of the tegmen, excluding the costal area. The narrow depression marking the nodal

line transparent. Wings smoky, pale basally, veins darker, varying from pale to completely smoky. Insect in life powdered a pale fawn.

Anal segment of male with a prominent median ventral process, trilobed at apex, middle lobe longest; deflexed part of segment rather shorter than horizontal part. Aedeagus with a pair of dorsal spines apically, projecting anteriorly for two thirds length of aedeagus, ventrally a pair of thin spines, as long as aedeagus, curving downwards, then sweeping upwards and backwards; genital styles with dorsal border excavated before apex; apical process short, blunt, slightly recurved at tip.

Anal segment of female short, bluntly rounded; genital styles small, rounded, devoid of tooth-like processes. Egg approximately rectangular, pointed at one end, operculate.

Redescribed from 4 males and 3 females collected by Mr. F. A. Squire on pigeon pea and mango (May 12 and 13, 1937) and by the writer on pigeon pea (Mar 31, 1941) at Kingstown, St. Vincent, B. W. I. Topotype material in U. S. National Museum, Washington. Differs from *O. grenadensis* in having no dark basal area on tegmen, and in the length of the dorsal spines on the aedeagus.

Ormenis grenadensis, n. sp.

Male.—Length, 5.6 mm.; tegmen, 6.2 mm. *Female*. Length, 5.6 mm.; tegmen, 6.6 mm. Frons broader than long (1.2 to 1), median carina distinct on basal two thirds, absent from apical third, lateral carinae absent, or only indicated at base, lateral margins carinate; no carinae on clypeus; vertex very short. Width of head (with eyes) scarcely equal to width of thorax. Pronotum with a slight depression anteriorly on each side of middle line; mesonotum without carinae, or only an indication of median and lateral carinae basally. Hind tibia with two spines before apex. Costal area of tegmen slightly granulate, Sc strong, simple to apex, Sc, R and M arising from a common stem, R forking half way along tegmen, M forking markedly basad of R fork, and Cu forking slightly basad of M fork. Base of R and M granulate. Nodal line feebly marked by irregular cross-veins and a depression across tegmen from node to apex of clavus; apical line even and distinct; clavus granulate over basal two thirds.

Pronotum light fuscous, mesonotum light fuscous in middle, orange or testaceous laterad of this, dark fuscous still further laterad. Frons, clypeus, and genae very pale yellow, sometimes very slightly smoky, antennae light fuscous, eyes with a black spot, edged with white, on antero-dorsal margin. Femora pale yellow, tibiae and tarsi pale testaceous. Abdomen in life generally orange, tergites light fuscous, sternites paler, genitalia fuscous. Tegmina tawny, a dark fuscous area basally, and a smoky area distad of nodal line; veins entering dark area pale as far as nodal line, then concolorous. Wings smoky, veins dark. Insect in life powdered a pale fawn.

Anal segment of male with strong ventral median process, almost trilobed on ventral margin; apical part of segment strongly deflexed, shorter than horizontal part. Aedeagus with a pair of spinose processes dorsally, one quarter length of aedeagus, ventrally two slender processes curving anteriorly,

then sweeping posteriorly to tip of dorsal processes; genital styles with dorsal margin excavated before apex; apical process a flattened plate bluntly curved at tip.

Anal segment of female short, bluntly rounded; genital styles small, oval, devoid of tooth-like processes on apical margin. Egg approximately rectangular, pointed at one end, operculate.

Described from 6 males and 5 females collected at Grand Anse, Grenada, B. W. I., by the writer (Mar. 31, 1941) on *Coccoloba uvifera*. The pattern of the tegmen and the short dorsal spines on the aedeagus distinguish this species from others of the *contaminata* group. Type material in U. S. National Museum, Washington.

Ormenis fuliginosa, n. sp.

Male.—Length, 6.7 mm.; tegmen, 9.2 mm. *Female*. Length, 7.2 mm.; tegmen, 10.0 mm. Frons broader than long (1.5 to 1) evenly rounded laterally and ventrally, median carina distinct only on basal third, absent from apical two thirds, lateral carinae absent, lateral margins carinate; no carinae on clypeus; vertex very short. Width of head (with eyes) equal to width of thorax. Pronotum smooth, with a minute depression anteriorly on each side of middle line; mesonotum without carinae, or median carina slightly indicated apically. Hind tibia with two spines before apex. Costal area slightly granulate, Sc strong, simple to apex, R arising from M near its base, forking about one third from base of tegmen, M forking about level with R fork, Cu forking basad of R fork. Base of R and M slightly granulate. Nodal line distinctly marked with a regular series of cross-veins, produced distally in anterior half, parallel to apical margin in middle, and curving distally before end near apex of clavus; apical line fairly even and distinct; clavus strongly granulate.

Pronotum and mesonotum black or very dark brown, frons dark reddish-brown or fuscous, lateral margins and median carina testaceous, clypeus fuscous laterally, testaceous medially, genae and antennae fuscous or testaceous, eyes dark red; legs pale testaceous or brown; abdomen and genitalia fuscous, sometimes paler. Tegmina wholly smoky brown or black with costal area dark. Wings more or less smoky, veins darker. Insect in life powdered blue.

Anal segment of male with no median ventral process; apical part of segment only slightly deflexed; aedeagus long and only slightly curved, ventrally a pair of short spines, one sixth length of aedeagus, arising near these a pair of long, narrow spinose processes, almost as long as aedeagus; genital styles broad, expanding apically, with dorsal margin entire; apical process somewhat spatulate, twisted inwards, hairy at tip.

Anal segment of female short, bluntly rounded; genital styles broad, thick, with tooth-like processes on apical margin. Egg ovoid, smooth.

Described from 3 males and 6 females collected in Trinidad, B. W. I., as follows: 2 males and 3 females on cacao at Nonpareil Estate (H. A. Ballou, Jan. 6, 1925), 3 females from St. Augustine

(R. G. Fennah, Apr. 20, 1934) and one male reared from a nymph collected on cacao at Brasso (E. McCallan Sept. 20, 1939). This species is distinguished by the smoky costal area and the processes of the aedeagus from other dark species. Type in U. S. N. M., Washington.

Ormenis nigrospersa, n. sp.

Male.—Length, 8.0 mm.; tegmen, 10.4 mm. *Female*. Length, 8.1 mm.; tegmen, 11.2 mm. Frons broader than long (1.5 to 1), median carina distinct on basal half, absent from apical half, lateral carinae absent, lateral margins carinate; no carinae on clypeus; vertex very short. Width of head (with eyes) equal to width of thorax. Pronotum with a slight depression anteriorly on each side of middle line; mesonotum without carinae, or only an indication of median carina apically and of lateral carinae basally. Hind tibia with two spines before apex. Costal area broad, slightly granulate; Sc strong, simple to apex, Sc, R and M arising from a common stem, R forking just basad of middle of tegmen, M forking basad of R fork, Cu forking basad of former two. Base of R and M granulate. Nodal line well defined by cross-veins, subparallel to apical margin of tegmen, apical line irregular but well marked. Apical margin of tegmen produced into a lobe at junction with hind margin. Clavus granulate.

Pronotum yellow, dark medially, about thirteen dark spots on each side; mesonotum yellow, marbled fuscous in four broad longitudinal bands, scutellum fuscous; vertex yellow with a median fuscous spot and a pair of short dark lines, sloping outwards, near each side; frons, clypeus, and genae very pale yellow, basal joint of antennae pale yellow, a dark spot dorsally, eyes grey. Legs very pale yellow, tarsi testaceous. Abdomen and genitalia white or pale yellow. Tegmina brownish-yellow, transparent distad of nodal line; costal area with about fifteen dark spots occurring singly or in pairs; Sc with four dark spots near base; a dark spot overlying R fork, and a spot basad of it; a broad dark area, somewhat mottled, from node to middle of tegmen, basad of nodal line, then past apex of clavus to posterior apical lobe of tegmen; apical line with dark spots, junctions of veins distad of it spotted, apical margin narrowly edged with fuscous. Wings light fuscous or transparent, veins concolorous. Insect in life uniformly powdered a pale greyish brown.

Anal segment of male long, devoid of a median ventral process; apical part of segment only slightly deflexed; aedeagus tubular with a pair of bifurcate ventral processes arising near apex, and curving anteriorly; length of outer branch of each process three-quarters length of aedeagus, that of inner branch shorter; genital styles with dorsal margin straight, apical process a spine, slightly curving anteriorly.

Anal segment of female short, flattened dorso-ventrally, and bluntly rounded; genital styles broad and thick, bordered with tooth-like processes on apical margin. Egg ovoid.

Described from 5 males and 10 females collected at St. Augustine, Trinidad, B. W. I., by the writer (Apr. 4, 1941) on cacao,

Bromelia pinguin and various shrubs. Type material in the United States National Museum, Washington.

Ormenis rufa, n. sp.

Male.—Length, 9.6 mm.; tegmen, 13.6 mm. **Female.** Length, 11.0 mm.; tegmen 14.0 mm. Frons broader (1.4 to 1), median carina only moderately distinct on basal half, absent from apical half, lateral carinae absent or only indicated at base, lateral margins carinate; no carinae on clypeus; vertex very short. Head (with eyes) about as wide as thorax; pronotum smooth; mesonotum without carinae, or median carina indicated in apical third, and lateral carinae basally. Hind tibia with two spines before apex; costal area broad, slightly granulate, Sc strong, simple to apex, Sc, R and M arising from common stem, R forking rather less than one third from base of tegmen, M forking slightly basad of R fork, Cu forking slightly basad of latter. Base of R and M granulate. Nodal line clearly defined by cross-veins, deeply incurved about middle towards base of tegmen; apical line even, subparallel to apical margin. Clavus strongly granulate.

Pronotum and mesonotum tawny; frons, clypeus, and genae pale yellowish brown, basal joint of antennae slightly darker, eyes dark purple; legs very pale stramineous, tarsi pale testaceous; abdomen wholly white, genitalia white edged with black. Tegmina yellowish brown, costal area orange brown, area distad of nodal line rufous, apical line pale, a rufous line passing backwards and outwards from a point almost two thirds along costa, a second rufous line from middle of basal half of tegmen to apex of clavus. Wings pale orange broadly edged with orange-red. A pale form of the insect is devoid of markings, being wholly pale stramineous. Insect in life powdered uniformly a pale orange-brown.

Anal segment of male devoid of median ventral process; deflexed apical part of segment about equal in length to basal horizontal part; aedeagus with a pair of saw-edged processes arising apically and projecting anteriorly for rather less than half the length of aedeagus, and lying on its dorsal surface; a round knob close to apex on each side ventrally; on each side two narrow strap-like processes, arising together, the longer almost as long as the aedeagus, the shorter scarcely two thirds of the former; genital styles with dorsal margin straight, apical process a vertical peg, with tip slightly curved anteriorly.

Anal segment of female long, narrow and flattened dorso-ventrally; genital styles thick, expanding apically, bordered by black tooth-like processes on apical margin. Egg drop-shaped, with a large striated flange.

Described from 2 males and 4 females collected at St. Augustine, Trinidad, B. W. I., by H. A. Ballou (Jan 5, 1927) and by the writer (Apr. 4, 1941) feeding on cacao. This species is well distinguished by its large size, the pattern of the tegmina and the male genitalia. Type material in the U. S. N. M., Washington.



Ormenis unimaculata, n. sp.

Male.—Length, 4.8 mm.; tegmen, 6.2 mm. *Female*. Length, 4.6 mm.; tegmen, 6.8 mm. Frons broader than long (1.2 to 1), median carina distinct on basal half, sometimes only indicated, absent from apical half, lateral carinae absent, lateral margins carinate; no carinae on clypeus; vertex very short. Pronotum with a minute depression anteriorly on each side of middle line. Head (with eyes) about as wide as thorax; mesonotum without carinae. Hind tibia with two spines before apex. Costal area granulate, Sc strong, simple to apex, R and M arising together, R forking about one third from base of tegmen, M forking markedly basad of R fork, Cu level with M fork or further basad. Base of R and M granulate. Nodal line arcuate, distinctly indicated by cross-veins; apical line fairly even and distinct. Clavus strongly granulate.

Pronotum and mesonotum greenish white or greenish yellow, frons pale green or yellow, shading into pale yellow or orange, clypeus pale; genae and antennae pale yellow or green, latter orange distally. Legs pale green or stramineous, tarsi testaceous. Abdomen green or pale yellow, sometimes pale orange dorsally, genitalia pale green or yellow. Tegmina green, sometimes white, narrowly margined with orange, a series of dark spots between veins on apical margin, a conspicuous dark spot at apex of clavus. Wings milky. Insect in life powdered white or greenish white.

Anal segment of male with lateral margin produced ventrally into a point basad of apex; aedeagus devoid of processes, except blunt knobs apically; genital styles with dorsal margin entire, apical process spinose, somewhat curved.

Anal segment of female short, bluntly rounded; genital styles broad and thick, bordered with tooth-like processes on apical margin.

Described from 4 males and 2 females collected by Dr. E. McCallan, of the Imperial College of Tropical Agriculture, Trinidad, at Brasso, Trinidad, B. W. I., on various dates between Oct. 5, 1939, and Oct. 25, 1940, feeding on cacao. Type material in the U. S. National Museum, Washington.

EXPLANATION OF PLATES.

Plate 20.

- Fig. 1, 2, *O. marginata* lateral view ♂ and ♀ genitalia, with egg.
Fig. 3, 4, *O. albicostalis* lateral view ♂ and ♀ genitalia, with egg.
Fig. 5, 6, *O. septempunctata* lateral view ♂ and ♀ genitalia, with egg.
Fig. 7, 8, *O. palicoureae* lateral view ♂ and ♀ genitalia, with egg.
Fig. 9, 10, *O. silvestris* lateral view ♂ and ♀ genitalia, with egg.
Fig. 11, 12, *O. sanctaliciensis* lateral view ♂ and ♀ genitalia, with egg.
Fig. 13, 14, *O. plumbea* lateral view ♂ and ♀ genitalia, with egg.
Fig. 15, 16, *O. fortunata* lateral view ♂ and ♀ genitalia, with egg.

Plate 21.

- Fig. 17, 18, *O. barbadensis* lateral view ♂ and ♀ genitalia.
Fig. 19, 20, *O. contaminata* lateral view ♂ and ♀ genitalia.

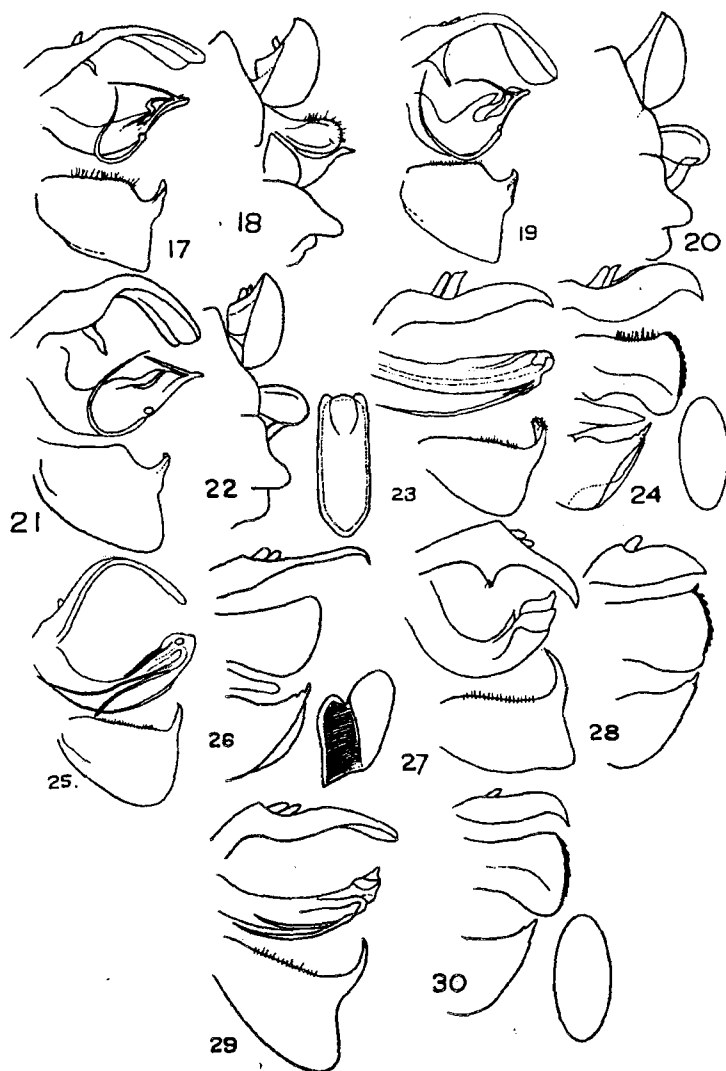


Fig. 21, 22, *O. grenadensis* lateral view ♂ and ♀ genitalia, with egg.

Fig. 23, 24, *O. fuliginosa* lateral view ♂ and ♀ genitalia, with egg.

Fig. 25, 26, *O. rufa* lateral view ♂ and ♀ genitalia, with egg.

Fig. 27, 28, *O. unimaculata* lateral view ♂ and ♀ genitalia.

Fig. 29, 30. *O. nigrospersa* lateral view ♂ and ♀ genitalia, with egg.
