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ENTOMOLOGY.—*A new genus and twelve new species of Neotropical whiteflies (Homoptera: Aleyrodidae).*¹ LOUISE M. RUSSELL, Bureau of Entomology and Plant Quarantine. (Communicated by C. F. W. MUESEBECK.)

This paper treats the pupae of an interesting new genus of Aleyrodidae that is widely distributed in the Antillean Subregion of the Neotropical Region but that is unknown elsewhere. Members of the group appear to be somewhat restricted in their host associations, for each available species is recorded from only one plant genus, and several of those at hand are known from a single species of plant. Such geographical and host limitations doubtless will be somewhat modified by additional collecting, however. Two species described here, from *Malpighia* and *Stigmaphyllon*, respectively, were received for identification. Ten species were collected from herbarial specimens of *Coccoloba* by Marjorie J. Camp, Bureau of Entomology and Plant Quarantine, through the courtesy of the persons in charge of the Arnold Arboretum, the Gray Herbarium, the New York Botanic Garden, and the United States National Herbarium. In the collection data for the species from *Coccoloba* the names of the herbaria are abbreviated; the name of the plant collector is given when known. Type specimens are in the collection of the United States National Museum.

Crenidorsum, n. gen.

The genus *Crenidorsum* is composed of both similar and diverse species, with intergrading forms between the extremes of the group. Little variation has been observed in the characters which separate the species, and the most closely related forms are amply distinct from one another. The genus appears to be most closely allied to three genera established by Quaintance and Baker, *Aleuroplatus*, *Aleurotrachelus*, and *Aleurotulus*, and superficially at least it resembles *Aleuroputeus* and *Laingiella*,

both erected by Corbett for Oriental species. *Crenidorsum* can be distinguished from these and other genera by the following combination of characters: A somewhat longitudinal, differentiated line consisting of a row of scallop-shaped thickenings, or a ridge, or a furrow, in inner subdorsum (for terminology see Russell, Proc. Ent. Soc. Washington **45**: [131]-132, 1943) on each half of body; those intersegmental sutures lying between differentiated lines terminating mesad of lines; vasiform orifice subcordate to broadly elliptical, its sides apparently without minute spines and not continued forward to form the bottom of the orifice; operculum nearly or actually filling orifice, not recessed posteriorly; lingula appearing jointed near the center, expanded distally but not transverse, with an apical notch; submedian cephalic setae present; submargin not separated from dorsal disk; without median abdominal disk pores, a complete submarginal or subdorsal row of setae, or a tubercle between caudal setae.

Generic description.—Body somewhat oval, flat to slightly convex dorsally, flat ventrally. Brown or black and heavily sclerotized, or colorless and membranous.

Body margin weakly to strongly dentate. Anterior and posterior marginal setae present. Ridges extending mesad from margin. Submargin not separated from dorsal disk, not deflexed.

A somewhat longitudinal, differentiated line consisting of a row of scallop-shaped thickenings, or a ridge, or a furrow, in inner subdorsal area of cephalothorax and abdomen, on each half of body. A submedian pair of cephalic, eighth abdominal, and caudal setae. Three subdorsal pairs of minute setae on thorax and 1 anteriorly on abdomen. Transverse molting suture extending laterocaudad from its midpoint, curved cephalad slightly mesad of, and

¹ Received November 11, 1944.

continued at least to, differentiated lines; its center approximately three times as far from mesometathoracic suture as from thoracoabdominal one. Intersegmental sutures between differentiated lines terminating mesad of lines; cephalothoracic and promesothoracic sutures curved posteriorly. Median length of cephalic segment greater than that of thorax; pro-, meso-, and metathorax subequal; abdominal segments 1-6 subequal. Pockets rather small, not contiguous. Pairs of submedian depressions arranged as follows: Three on cephalic segment (1 or 2 mesocephalad and 0 or 1 mesad of setae, and 1 posterior to setae near suture), 2 small or 1 large in cephalothoracic suture, 1 on prothorax, 1 in promesothoracic suture, 1 each on meso- and metathorax, 1 adjoining posteriorly thoracoabdominal and each abdominal suture; cephalothoracic and posterior abdominal ones often rather faint. Vasiform orifice subcordate to broadly elliptical, located approximately its length from posterior suture and at least its length from body margin; its sides minutely ridged vertically, apparently without minute spines, slightly converging near base but nearly vertical, not continued forward to form the bottom of the orifice; rim of orifice rather thick. Operculum nearly or actually filling orifice, not recessed; ventrally covered with minute spines, a pair of small setae near center. Lingula somewhat linear near base, narrowed and appearing jointed near the center; gradually expanded distally, but not transverse, with an apical notch; longer than orifice but lying in a curved position and contained in it; a pair of minute lobes bearing a pair of small setae, near base of expanded area; a pair of elongate setae arising ventrally just before apex; covered with minute spines. Caudal furrow broad, shallow. Caudal ridges (ridges laterad of either or both the vasiform orifice and caudal furrow) present.

Tracheal folds defined. Spiracles small, thoracic and anterior abdominal pair nearly as large as posterior pair, the latter slightly posterior to widest part of orifice. Antenna reaching to anterior spiracle; distal eighth narrowed, covered with minute spines, a sensorium at base and a seta at apex. Two minute setae just before disk of each leg, one just before these, and at least one on inner basal area of each middle and posterior leg. One pair of adhesive sacs. Male organ apparently a simple (not bifid) sac.

Genotype, *Crenidorsum tuberculatum*, n. sp.

KEY TO SPECIES OF CRENIDORSUM

1. Minute spines absent ventrally; submedian cephalothoracic and eighth abdominal setae either about 14μ long and somewhat nail-shaped, or about 6 or $100-125\mu$ long and slender, not stout at base in relation to length (Figs. 5, 18, 20).....2
 Minute spines present ventrally; submedian cephalothoracic and eighth abdominal setae $30-60\mu$ long, somewhat conical, stout at base in relation to length (Figs. 22, 30).....9
2. Derm brown or black and heavily sclerotized; a row of large scallop-shaped thickenings in inner subdorsum, terminating on abdominal segment 7; submarginal teeth present; minute setal bases present, located mesad of scallops; submedian cephalothoracic and eighth abdominal setae somewhat nail-shaped (Fig. 5).....3
 Derm colorless and membranous; a row of small scallop-shaped thickenings, or a ridge with scallops suggested, or a furrow without a suggestion of scallops, in inner subdorsum, each terminating before abdominal segment 7; submarginal teeth apparently absent; minute setal bases absent; submedian cephalothoracic and eighth abdominal setae tapered from base to tip (Figs. 18, 20).....7
3. Outer side of ridge over scallops densely sclerotized and tending to be divided into somewhat rectangular, transverse plates with a plate over each scallop, rows of minute, stout spines running lengthwise of each plate (Figs. 10, 11); submedian depressions and intersegmental sutures unusually conspicuous, deep, dotted and bordered with minute irregular areas and minute spines (Fig. 10); marginal teeth about twice as long as wide, about 15 in 100μ ; 3 pairs of subdorsal minute setae on cephalic segment.
ornatum, n. sp.
 Outer side of ridge over scallops, and submedian depressions and intersegmental sutures not as in *ornatum*; marginal teeth not or only slightly longer than wide, no more than 13 in 100μ ; 0 or 1 pair of subdorsal minute setae on cephalic segment...4
4. Outer disk pores subdorsal in position, the majority approximately three times the width of a marginal tooth from submarginal teeth (Fig. 3); a well-defined median tubercle on each of abdominal segments 2-6 (Fig. 1); 1 pair of outer subdorsal minute setae on cephalic segment.
tuberculatum, n. sp.
 Outer disk pores submarginal in position, the majority no more than the width of a marginal tooth from submarginal teeth; median tubercles absent, or well-defined only on abdominal segments 2-5; no subdorsal minute setae on cephalic segment.....5
5. Two pairs of subdorsal disk pores on posterior segment, 0 just laterocaudad of vasi-

- form orifice (Fig. 12); majority of outer disk pores the width of a marginal tooth from submarginal teeth; most marginal teeth slightly longer than wide, approximately 13 in 100μ*commune*, n. sp.
- Three pairs of subdorsal disk pores on posterior segment, 1 pair just laterocaudad of vasiform orifice; majority of outer disk pores at ends of submarginal teeth; most marginal teeth at least as wide as long, approximately 10 in 100μ6
6. A median tubercle on each of abdominal segments 2-5; ends of body broadly curved, the posterior end as broad as the anterior end and nearly straight in the center; caudal setae as near to body margin as to vasiform orifice.....*malpighiae*, n. sp.
- No median tubercles on abdomen; ends of body less broadly curved, the posterior end narrower than the anterior end and curved in the center (Fig. 13); caudal setae about one-third nearer to vasiform orifice than to body margin.....*armatae*, n. sp.
7. (2) Differentiated inner subdorsal line consisting mostly of small scallops (Fig. 14); submedian mesothoracic setae present, these and other submedian setae about 6μ long.
leve, n. sp.
- Differentiated inner subdorsal line either a ridge or a furrow, without distinct scallops; submedian mesothoracic setae absent, or these and other submedian setae at least 100μ long.....8
8. Differentiated inner subdorsal line a low distinct ridge sclerotized on its outer side (Fig. 17); submedian setae approximately $100-125\mu$ long, mesothoracic pair present (Fig. 16); 0 submedian disk pores on first abdominal segment, 1 inner subdorsal pair on meso- and metathorax (Fig. 16).
differens, n. sp.
- Differentiated inner subdorsal line a narrow furrow sclerotized on each side (Fig. 19); submedian setae approximately 6μ long, mesothoracic pair absent (Fig. 21); 1 pair of submedian disk pores on first abdominal segment, 2 inner subdorsal pairs on meso- and metathorax (Fig. 21).*marginale*, n. sp.
9. (1) Derm membranous, colorless; submedian meso- and metathoracic setae absent, cephalic ones about 40μ long, and 8μ in diameter at the base, eighth abdominal ones about 30μ long, and 6μ in diameter at the base; rows of scallops terminating on abdominal segment 6 (Fig. 29).
diaphanum, n. sp.
- Derm sclerotized, brown or black; submedian meso- and metathoracic setae present, these, cephalic, and eighth abdominal ones about 60μ long, and $14-20\mu$ in diameter at the base; rows of scallops terminating on abdominal segment 5.....10
10. Ridges extending inward from submarginal furrow of ventral surface except in tracheal folds and beside abdominal tracheal fold; a band of minute spines reaching from ridges to submedian area, also present across tracheal folds (Fig. 26); a tongue-shaped projection extending inward from collar around each submedian cephalothoracic seta (Fig. 28); 20-26 scallops in each row.....*stigmaphylli*, n. sp.
- Ridges extending inward from submarginal furrow of ventral surface much less numerous than in *stigmaphylli*, or absent; minute spines much less numerous or arranged differently than in *stigmaphylli*; no tongue-shaped projection extending inward from collar around submedian cephalothoracic seta; 26-36 scallops in each row.....11
11. Ventral surface with ridges extending mesad from submarginal furrow on cephalic segment and on abdominal segments 2-4; minute spines in a band starting near median line anteriorly, and terminating before ventral abdominal setae, mesad of ridges (Fig. 25); a rather deep invagination in anterior margin of vasiform orifice (Fig. 24); caudal setae considerably farther apart than eighth abdominal ones.....*debordae*, n. sp.
- Ventral surface without ridges; minute spines along tracheal tract from anterior edge of thoracic tracheal folds to anterior abdominal spiracles (Fig. 23); a relatively shallow invagination in anterior margin of vasiform orifice; caudal setae as far apart as eighth abdominal ones.....*magnisetae*, n. sp.

Crenidorsum tuberculatum, n. sp.

Figs. 1-5

White, cottony, waxy material extending outward from submargin in contiguous strands about one-third as long as width of body; similar strands also extending from inner subdorsum to body margin; a few flecks of white, waxy material scattered mesad of strands. A layer of transparent, colorless wax present ventrally, rather thick at margin, thin elsewhere.

Body broadly oval, ends broadly curved, posterior end nearly straight in center; slightly narrowed on pro- and mesothorax, widest across metathorax and first abdominal segment; $0.75-1.10$ mm long and $0.60-0.85$ wide. Brown to black, heavily sclerotized.

Marginal teeth strong, close-set, their sides converging slightly and their apices broadly curved, slightly longer than wide, 3 or 4 at each tracheal pore area often slightly smaller than others, slightly variable in width, approximately 10 in 100μ . Submarginal teeth located slightly mesad of marginal ones, weak, light colored, netlike in appearance. Each marginal seta about 28μ long.

Ridges extending from margin to inner subdorsum, as wide as a marginal tooth in submargin, at least twice that width in subdorsum. An inner subdorsal row of 24–30 strong, heavily sclerotized, scallop-shaped thickenings; 1 or 2 scallops smaller and mesad of others (sometimes poorly defined) on cephalic segment, rows slightly and evenly curved from cephalothoracic suture, terminating on abdominal segment 7; scallops nearly contiguous, the curved portion extending into the body cavity, the outer ends in derm and forming the basal part of the outer side of a rather sharp ridge extending over scallops; scallops as long as height of ridge; outer side of ridge more heavily sclerotized than subdorsum, a membranous line at top of ridge. A subcircular or transverse, smooth, median tubercle near posterior edge of each of abdominal segments 2–6. A submedian pair of meso- and metathoracic setae present; these, cephalic, and eighth abdominal ones somewhat nail-shaped, about 14μ long; metathoracic ones located close to anterior edge of transverse molting suture, eighth abdominal pair cephalolaterad of vasiform orifice, midway between orifice and posterior suture; caudal setae tapered from base, about 6μ long, located on outer side or on top of caudal ridges, slightly nearer to body margin than to orifice, practically as far apart as eighth abdominal ones. The four pairs of subdorsal minute setae in central subdorsum, an additional pair in outer subdorsum on cephalic segment. Two inner subdorsal (mesad of scallops) pairs of minute setal bases on prothorax and 1 pair usually on each of abdominal segments 3–5. Inner margin of disk pores not circular, with 2–5 points, larger than associated porettes; pores arranged in a row about three times the width of a marginal tooth from submarginal teeth, about one-seventh as numerous as teeth; other pores in a row distad of and about one-half as numerous as scallops; an occasional pair between the rows and 3 or 4 central subdorsal pairs on cephalic segment; mesad of rows of scallops and an imaginary curved line extend-

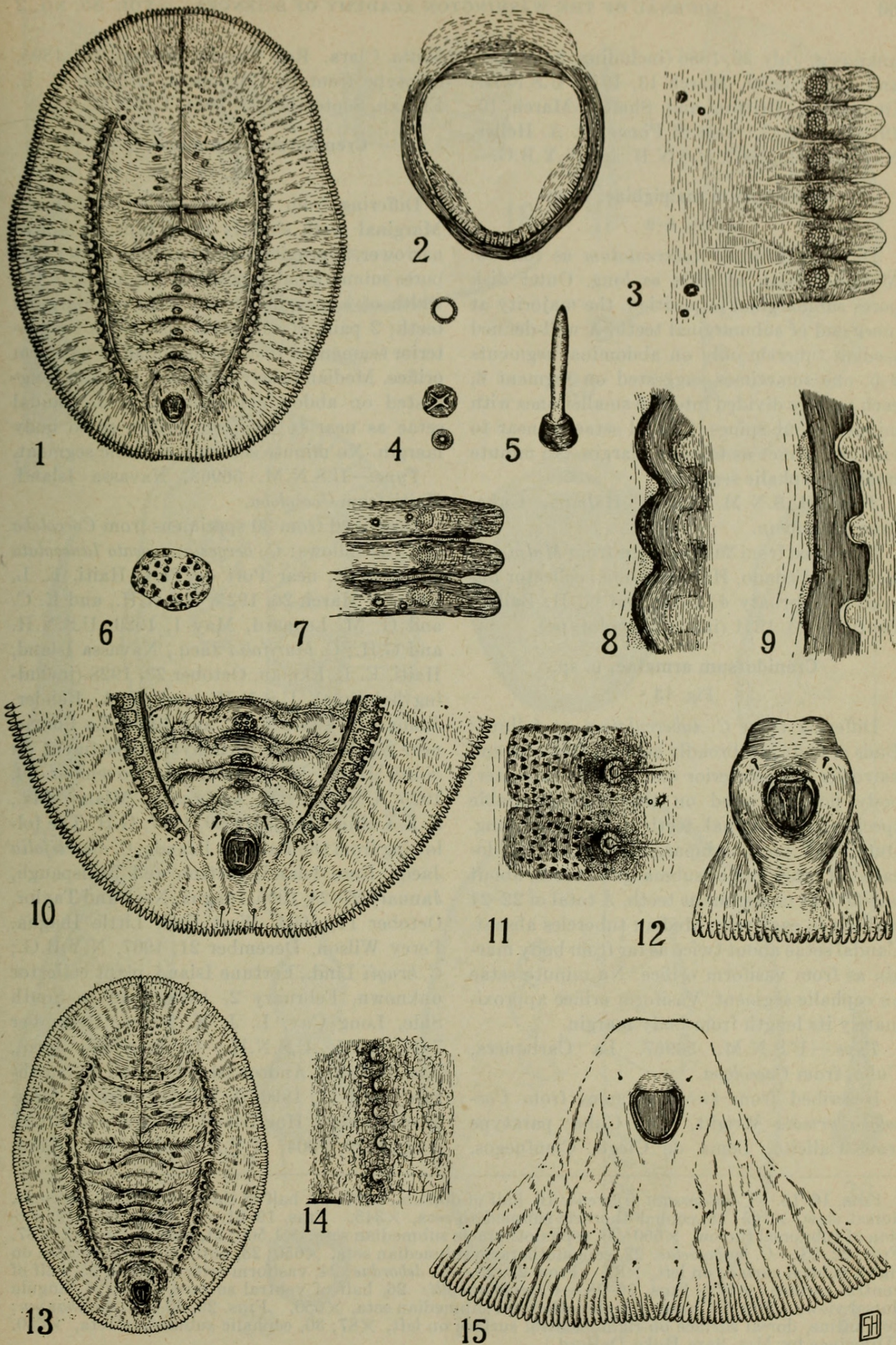
ing from their ends to median line of body, pairs of pores arranged as follows: Cephalic segment, 1 submedian anteriorly and 1 near cephalothoracic suture, and 1 subdorsal; prothorax, 1 submedian and 2 subdorsal; meso- and metathorax, each 2 submedian and 1 subdorsal; first abdominal segment, 0; second, 1 submedian; third through fifth, and seventh, each 1 submedian and 1 subdorsal; sixth, 1 subdorsal and rarely 1 or 2 submedian pores; eighth, 1 subdorsal laterocaudad of eighth abdominal seta, 1 slightly posterior to widest part of orifice, and 1 just laterocaudad of orifice. Transverse molting suture terminating just outside scallops, its ends nearly opposite its center; a little transverse sculpturing along median molting suture; abdominal sutures 1–6 terminating just outside submedian area, their ends nearly straight; abdominal segment 7 one-half to two-thirds as long as segment 6; intersegmental sutures and submedian depressions moderately defined, the latter more distinct on abdomen than on cephalothorax. Vasiform orifice subcordate, the outer edge of its rim not, or barely defined anteriorly, but the inner edge of its rim defined around anterior end of orifice, measuring $48\text{--}62\mu$ long and wide (including lip between rim and margin anteriorly and rim elsewhere, the former $4\text{--}6\mu$ long and the latter $4\text{--}6\mu$ thick); orifice slightly elevated, a depressed line along its sides, located about one and one-third times its length from body margin. Operculum filling orifice, with 2 longitudinal depressed lines and 1 or 2 transverse ones. Caudal ridges weak, extending from opposite orifice to caudal setae.

Ventrally a membranous furrow just within margin. Minute, slender, spine-shaped markings in abdominal tracheal fold. Ventral abdominal setae 24μ long.

Type.—U.S.N.M. 56965. Between Guayanilla and Tallaboa, Puerto Rico, from *Coccoloba*.

Described from 14 specimens collected from *Coccoloba obtusifolia* Jacq. in Puerto Rico; between Guayanilla and Tallaboa, plant collector

FIGS. 1–5.—*Crenidorsum tuberculatum*: 1, dorsum, $\times 87$; 2, vasiform orifice, without operculum or lingula, $\times 530$; 3, section of margin and submargin, $\times 650$; 4, minute setal base, disk pore and porette, $\times 1,500$; 5, cephalothoracic submedian seta, $\times 1,500$. FIGS. 6–9.—*C. malpighiae*: 6, median tubercle, $\times 650$; 7, section of margin and submargin, $\times 650$; 8, subdorsal scallops, ventral view, $\times 650$; 9, subdorsal scallops, dorsal view, $\times 650$. FIGS. 10, 11.—*C. ornatum*: 10, posterior 4 segments, dorsal view, $\times 115$; 11, plates above scallops, $\times 530$. FIG. 12.—*C. commune*, posterior segment, dorsal view, $\times 165$. FIG. 13.—*C. armatae*, dorsum, $\times 87$. FIGS. 14, 15.—*C. leve*: 14, area around scallops, $\times 650$; 15, posterior segment, dorsal view, $\times 165$.



FIGS. 1-15.—(See opposite page for explanation).

unknown, July 29, 1886 (including, holotype), and J. A. Shafer, March 13, 1913, U.S.N.H.; Guayanilla, Britton and Shafer, March 10, 1913, N.Y.B.G.; west of Ponce, A. A. Heller, November 26, 1902, U.S.N.H. and N.Y.B.G.

***Crenidorsum malpighiae*, n. sp.**

Figs. 6-9

Differing from *C. tuberculatum* as follows: Marginal teeth as wide as long. Outer disk pores submarginal in position, the majority at inner end of submarginal teeth. A well-defined median tubercle only on abdominal segments 2-5, one sometimes suggested on segment 6, each usually divided into 3-5 smaller ones with minute, stout spines. Caudal setae as near to vasiform orifice as to body margin. No minute setae on cephalic segment.

Type.—U.S.N.M. 56966. Habana, Cuba, from *Malpighia*.

Described from 30 specimens from *Malpighia glabra* L., Vedado, Habana, Cuba, collector unknown, February 4, 1919, and C. H. Ballou, February 23, 1921 (including holotype).

***Crenidorsum armatae*, n. sp.**

Fig. 13

Differing from *C. tuberculatum* as follows: Ends of body less broadly curved, posterior end narrower than anterior end, curved in center; body not narrowed on thorax in available specimens. Marginal teeth as wide as long. Outer disk pores submarginal in position, located at inner end of submarginal teeth, about one-fifth as numerous as teeth. A total of 22-24 scallops in each row. Median tubercles absent. Caudal setae about twice as far from body margin as from vasiform orifice. No minute setae on cephalic segment. Vasiform orifice approximately its length from body margin.

Type.—U.S.N.M. 56967. La Carbonera, Cuba, from *Coccoloba*.

Described from two specimens from *Coccoloba armata* Wright, from Cuba; paratype from Calicito, Loma de Ciego, Cienfuegos,

Santa Clara, Rob Combs, August 26, 1895, holotype from La Carbonera, Oriente, E. L. Ekman, September 23, 1914, U.S.N.H.

***Crenidorsum commune*, n. sp.**

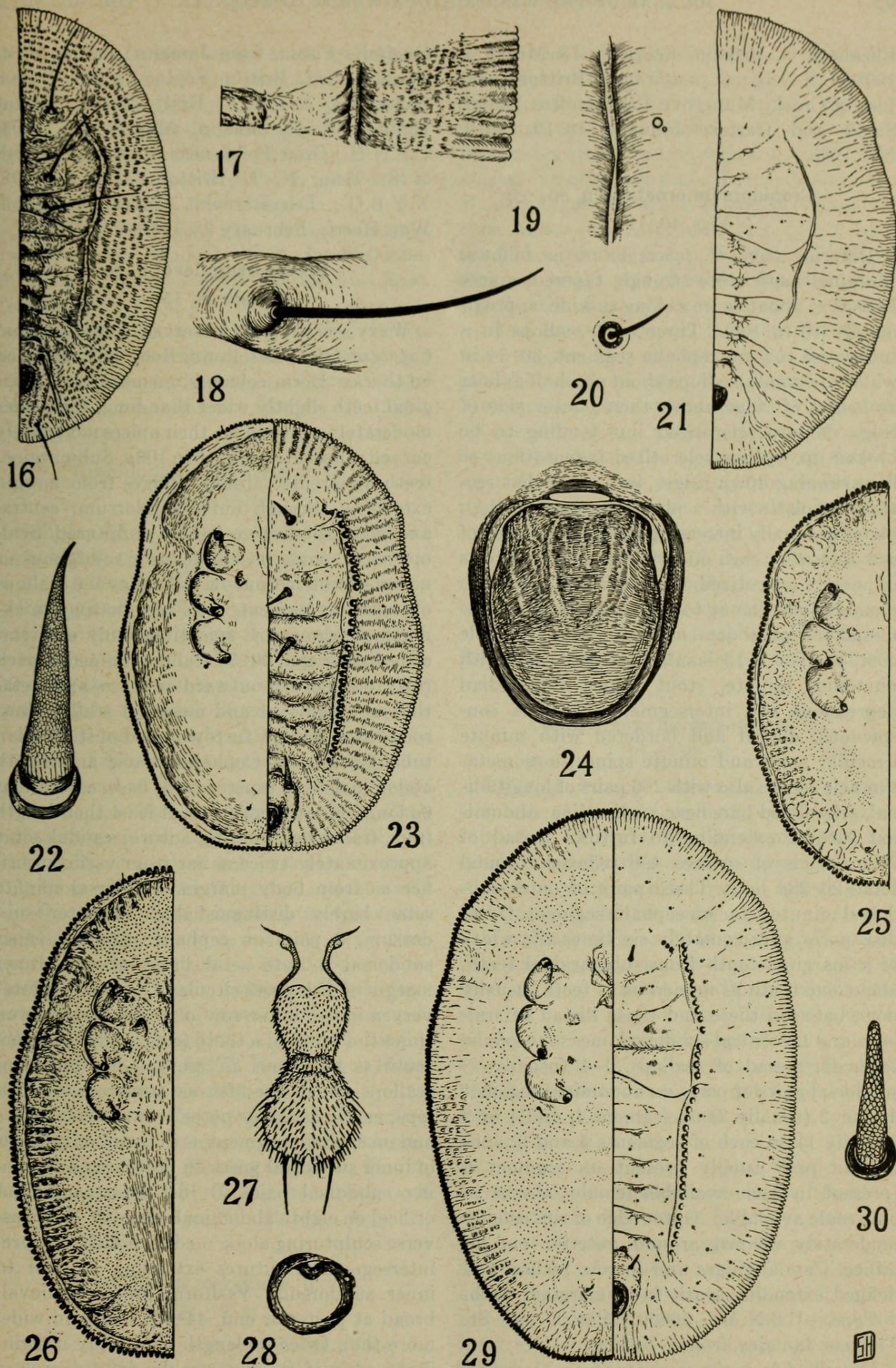
Fig. 12

Differing from *C. tuberculatum* as follows: Marginal teeth slightly more tapered, apices narrower, approximately 13 in 100 μ . Outer disk pores submarginal in position, the majority the width of a marginal tooth from submarginal teeth; 2 pairs of subdorsal disk pores on posterior segment, 0 just laterocaudad of vasiform orifice. Median tubercles absent, or barely suggested on abdominal segments 3-5. Caudal setae as near to vasiform orifice as to body margin. No minute setae on cephalic segment.

Type.—U.S.N.M. 56968. Navassa Island, Haiti, from *Coccoloba*.

Described from 30 specimens from *Coccoloba* spp., as follows: *C. bergesiana ovato lanceolata* E. Schmidt, near Port de Paix, Haiti, E. L. Ekman, March 26, 1925, U.S.N.H., and E. C. and G. M. Leonard, May 1, 1929, U.S.N.H. and G.H.; *C. laurifolia* Jacq., Navassa Island, Haiti, E. L. Ekman, October 23, 1928 (including holotype), U.S.N.H., and H. A. Rehder, January 6, 1930, A. A., and Baille La Lomas, near St. Michel de l'Atalaye, Department du Nord, Haiti, E. C. Leonard, November 26, 1925, U.S.N.H.; *C. uvifera* L., Miami, Fla., J. F. Collins, December 9, 1917, G.H. The following from the Bahama Islands: *C. diversifolia* Jacq., Rose Island, Britton and Millspaugh, January 27-28, 1905, Inagua, Nash and Taylor, October 11, 1904, West End, Little Inagua, Percy Wilson, December 21, 1907, N.Y.B.G.; *C. krugii* Lind., Fortune Island, plant collector unknown, February 2, 1888, road to South Side, Long Cay, L. J. K. Brace, December 7-17, 1905, U.S.N.H.; *C. laurifolia* Jacq., Nicolls Town, Andros Island, J. and A. Northrop, April 11, 1890, N.Y.B.G., edge of Mangrove Swamp, Hog Island, Britton and Brace, August 29, 1904, N.Y.B.G., Harbour Island,

FIGS. 16-18.—*Crenidorsum differens*: 16, half of dorsum, $\times 87$; 17, half of third abdominal segment, dorsal view, $\times 165$; 18, cephalothoracic submedian seta, $\times 345$. FIGS. 19-21.—*C. marginale*: 19, section of subdorsal furrow, $\times 650$; 20, cephalothoracic submedian seta, $\times 1,500$; 21, half of dorsum, $\times 87$. FIGS. 22, 23.—*C. magnisetæ*: 22, cephalothoracic submedian seta, $\times 650$; 23, outline, dorsal surface on right, ventral surface on left, $\times 87$. FIGS. 24, 25.—*C. debordæ*: 24, vasiform orifice, $\times 650$; 25, half of ventral surface, $\times 87$. FIGS. 26-28.—*C. stigmaphylli*: 26, half of ventral surface, $\times 87$; 27, lingula dorsal view, $\times 460$; 28, base of cephalothoracic submedian seta, $\times 650$. FIGS. 29, 30.—*C. diaphanum*: 29, outline, dorsal surface on right, ventral surface on left, $\times 87$; 30, cephalic submedian seta, $\times 650$. (Drawings by Mrs. Sara Hoke DeBord.)



FIGS. 16-30.—(See opposite page for explanation.)

Elizabeth G. Britton, February 18–March 4, 1907, U.S.N.H.; *C. northropiae* Britton, near Lisbon Creek, Mangrove Cay, Andros Island, Small and Carter, January 16–19, 1910, N.Y.B.G.

***Crenidorsum ornatum*, n. sp.**

Figs. 10, 11

Differing from *C. tuberculatum* as follows: Marginal teeth more strongly tapered, apices narrower, about twice as long as wide, approximately 15 in 100 μ . Three or 4 scallops in a transverse row on cephalic segment, 30–34 in whole row, most scallops about one-half as long as height of ridge above them; outer side of ridge densely sclerotized but tending to be broken up, by less sclerotized indentations or lines running down ridges, into somewhat rectangular plates with a plate over each scallop; plates gradually increasing in size from ends of row to center, each one with longitudinal rows of heavily sclerotized, minute, stout spines; no membranous line at top of ridge but a furrow mesad of it on abdomen. Each median tubercle composed of 4–13 small tubercles each with numerous minute, stout spines. Submedian depressions and intersegmental sutures conspicuous, dotted and bordered with minute irregular areas and minute spines; mesometathoracic suture also with 2–6 pairs of longitudinal, sclerotized bars near median line; abdominal sutures extending to furrows mesad of ridges, ends of sutures 4–6 reflexed. Caudal setae 20–28 μ long. Three pairs of outer subdorsal minute setae on cephalic segment. Outer disk pores approximately six times the width of a marginal tooth from submarginal teeth, about one-tenth as numerous as teeth; usually none between these and those distad of scallops, and no central subdorsal ones on cephalic segment; mesad of scallops, 1–4 (usually 2) subdorsal pairs of pores on abdominal segment 3, 1 or 2 (usually 2) on segment 4, and 1 or 2 (usually 1) on each of segments 5 and 6; submedian pair usually present on segment 6 (present in each available female, absent in only male available). Outer edge of rim usually moderately defined around anterior end of orifice. Caudal ridges and furrow rather well defined, extending nearly to submarginal teeth.

Type.—U.S.N.M. 56969. Parish of St. Thomas, Jamaica, from *Coccoloba*.

Described from six specimens from *Coccoloba*

longifolia Fisch., from Jamaica: Parish of St. Thomas, N. L. Britton, September 15–19, 1908 (holotype), N.Y.B.G.; Holly Mount, Mount Diablo, W. R. Maxon, May 25–27, 1904, U.S.N.H.; Grier Field, near Moneague, Parish of St. Ann, N. L. Britton, April 3, 1908, N.Y.B.G.; Leicesterfield, Upper Clarendon, Wm. Harris, February 28, 1910, U.S.N.H.

***Crenidorsum leve*, n. sp.**

Figs. 14, 15

Waxy secretion not observed. Differing from *C. tuberculatum* as follows: Body not narrowed on thorax. Derm colorless, membranous. Marginal teeth slightly wider than long, their sides moderately converging, their apices moderately curved; approximately 16 in 100 μ . Submarginal teeth apparently absent. Ridges from margin extending through outer subdorsum, central and inner subdorsum lightly sculptured. Scallops small, some poorly defined, contiguous or not, a sclerotized furrow as long as 4–6 scallops on cephalic segment, rows terminating on abdominal segment 4, sometimes only a furrow at posterior end, 40–55 scallops defined in each row; rows curved outward on meso- and metathorax; ridge over and mesad of scallops low, rounded, a shallow furrow mesad of it. Median tubercles absent. Cephalothoracic and eighth abdominal setae tapered from base, each about 6 μ long; metathoracic pair at least their length from transverse molting suture; caudal setae approximately twice as far from vasiform orifice as from body margin. Subdorsal minute setae barely distinguishable, in outer subdorsum, 3 pairs on cephalic segment. Inner subdorsal minute setal bases absent. Inner margin of disk pores circular, they and porettes very minute; outer row of pores about seven times the width of a tooth from, and about one-tenth as numerous as, teeth; pores distad of scallops about one-fifth as numerous as scallops; nearly as many pores between these rows and on cephalic segment as in them; only 1 pair of inner subdorsal pores on prothorax and 2 inner subdorsal pairs (0 just laterocaudad of orifice) on eighth abdominal segment. No transverse sculpturing along median molting suture; intersegmental sutures extending at least to inner subdorsum. Vasiform orifice semioval, broad at posterior end, 44–56 μ long and wide, more than twice its length from body margin; inner edge of its rim weakly defined around

anterior end of orifice, a very short lip between it and margin of orifice. Operculum weakly or not sculptured, slightly narrower than orifice at posterior end, not quite filling orifice. Ventral surface without a submarginal furrow.

Type.—U.S.N.M. 56970. Seven miles west of Ponce, Puerto Rico, from *Coccoloba*.

Described from five specimens as follows: *Coccoloba krugii* Lind., Little St. James Island, St. Thomas, Virgin Islands, Britton and Rose, February 27, 1913, N.Y.B.G.; *C. obtusifolia* Jacq., Puerto Rico, 7 miles west of Ponce, A. A. Heller, November 26, 1902 (including holotype), A.A., and between Guayanilla and Tallaboa, J. A. Shafer, March 13, 1913, U.S.N.H.

Crenidorsum differens, n. sp.

Figs. 16–18

Differing from *C. leve* as follows: Posterior part of body narrower and less broadly curved than anterior end. Marginal teeth twice as wide as long, merely shallow crenulations, approximately 13 in 100 μ . Ridges from margin ending in outer subdorsum. Scallop not actually defined but the outer side of a well-defined ridge, extending from cephalothoracic suture to fifth abdominal segment, sclerotized and tending to be divided into units suggesting scallops; no furrow mesad of ridge. A low median tubercle on each of abdominal segments 2–5. Each cephalothoracic submedian seta about 125, and each eighth abdominal and caudal seta about 100 μ long, situated on tubercles; metathoracic pair the width of its tubercle from transverse molting suture. A low rachis extending from first abdominal suture to vasiform orifice. Vasiform orifice nearly twice its length from body margin. Caudal furrow and ridges unusually well-defined, reaching well toward margin.

Type.—U.S.N.M. 56971. Near Cudjoe Head, Montserrat, from *Coccoloba*.

Described from 45 specimens from *Coccoloba grandifolia* Jacq., from the Leeward Islands; near Cudjoe Head, Montserrat, J. A. Shafer, February 8, 1907 (including holotype), and Deshaies, Guadeloupe, H. Stehlé?, July 14, 1937, U.S.N.H.

Crenidorsum marginale, n. sp.

Figs. 19–21

Differing from *C. leve* as follows: Marginal teeth merely broad, short crenulations, about

18 in 100 μ . Subdorsal scallops and ridges absent, replaced by a lightly sclerotized, narrow furrow; portion of furrow on cephalic segment weak and continued from rest of furrow which terminates on abdominal segment 4 or 5. Submedian mesothoracic setae absent; caudal setae about half as far apart as eighth abdominal ones. Meso- and metathorax each with 2 inner subdorsal pairs of disk pores; first abdominal segment with 1 pair of submedian disk pores; eighth abdominal segment apparently with 3 pairs of pores (1 usually laterocaudad of orifice), anterior pair on this segment laterad or cephalolaterad of eighth abdominal setae. Transverse molting suture terminating at inner subdorsal furrows. Vasiform orifice 36–42 μ long and wide, inner edge of its rim well defined around anterior end, a well-defined lip between it and margin of orifice. Operculum broad at posterior end, nearly truncate.

Type.—U.S.N.M. 56972. Barahona, Dominican Republic, from *Coccoloba*.

Described from three specimens from *Coccoloba pubescens* L., near Barahona, Dominican Republic, E. L. Ekman, September 11, 1926, U.S.N.H.

Crenidorsum magnisetæ, n. sp.

Figs. 22, 23

Differing from *C. tuberculatum* as follows: Columns of white, flocculent, waxy material, supported on cephalothoracic and eighth abdominal setae, rising from dorsum, their ends curved outward and downward, covering and extending beyond the body.

Marginal teeth as wide as long. Three or four scallops on cephalic segment, a total of 26–36 in each row, terminating on abdominal segment 5; the majority one-half of the width to the width of a scallop apart, not quite so long as height of ridge over them; ridge low, broad, rounded, outer side not more heavily sclerotized than subdorsum, no membranous line at its top, a furrow mesad of it. Median tubercles absent. Each cephalothoracic and eighth abdominal seta approximately 60 μ long, and 14–20 μ in diameter at base, elongate conical, covered with minute spine-shaped designs in a netlike arrangement, set in thin collarlike bases; the eighth abdominal ones much nearer to posterior suture than to vasiform orifice and the area around their bases somewhat swollen; caudal setae as far apart as outermost point of

bases of eighth abdominal ones, usually located distad of caudal ridges. Three pairs of outer subdorsal minute setae on cephalic segment. One pair of inner subdorsal minute setal bases on prothorax. Mesad of scallops, 2 submedian disk pores at base of each cephalothoracic seta, no submedian pair on prothorax, anterior pair of posterior segment at bases of eighth abdominal setae. Intersegmental sutures reaching to furrows mesad of scallops; abdominal segment 7 practically as long as segment 6. Vasiform orifice broadly elliptical, slightly longer than wide, scarcely more than its length from body margin, about one and one-half times its length from posterior suture, unusually high; a narrow lip at anterior end, a shallow invagination between rim of orifice and lip. Caudal ridges rather well-defined opposite and just latero-caudad of orifice.

On ventral surface a few minute spines along tracheal tract from anterior edge of inner end of thoracic tracheal folds to anterior abdominal spiracles, mesad of each leg, and around adhesive sacs.

Type.—U.S.N.M. 56973. Grande Cayemite, Haiti, from *Coccoloba*.

Described from 16 specimens from *Coccoloba* spp. as follows: *C. diversifolia* Jacq., Grande Cayemite, Haiti, W. J. Eyerdam, August 1927 (including holotype), U.S.N.H., and below Hardware Gap, vicinity of Newcastle, Jamaica, Britton and Hollick, March 1, 1908, N.Y.B.G.; *C. retusa* Grieseb., Port Margot, Massif du Nord, Haiti, E. L. Ekman, December 11, 1924, U.S.N.H.; *C. revoluta* Leonard, vicinity of St. Michel de l'Atalaye, Department du Nord, Haiti, E. C. Leonard, November 20, 1925, U.S.N.H.

***Crenidorsum debordae*, n. sp.**

Figs. 24, 25

Differing from *C. magnisetæ* as follows: Caudal setae considerably farther apart than outermost point of bases of eighth abdominal setae. Usually 2 pairs of inner subdorsal minute setal bases on prothorax. Scallops about half as long as height of ridge over them; a well-defined furrow mesad of ridge. Inner edge of rim of orifice merging with margin at anterior angles of orifice, lip absent, a rather deep invagination in center of anterior margin of orifice. Ventrally, minute spines numerous, in a band well removed from margin, starting near median

line on cephalic segment, passing outside legs, greatly widened posterior to legs and terminating a little anterior to ventral abdominal setae; also present mesad of legs, but few or none around adhesive sacs. Several ridges, divided into irregularly shaped areas, between minute spines and submarginal furrow, in center of cephalic segment and on abdominal segments 2-4.

Type.—U.S.N.M. 56974. Petite Gonave Island, Haiti, from *Coccoloba*.

Described from 12 specimens from *Coccoloba rotundifolia* Meissn., Haiti, Petite Gonave Island, E. C. Leonard, July 9 and 10, 1920 (including holotype), west of Cabaret, January 12, and vicinity of Bassin Bleu, April 17, 1929, E. C. and G. M. Leonard, U.S.N.H.

***Crenidorsum stigmaphylli*, n. sp.**

Figs. 26-28

Differing from *C. magnisetæ* as follows: Marginal teeth as wide as, or slightly wider than long, their sides nearly parallel and their apices broad, approximately 8 in 100 μ . No scallops on cephalic segment but a short sclerotized furrow suggestive of them; 20-26 scallops defined in each row, about half as long as height of ridge over them; a deep furrow mesad of ridge. A tongue-shaped projection extending inward from collar around base of each submedian cephalothoracic seta; caudal setae located rather near ends of posterior suture, slightly farther apart than outermost point of bases of eighth abdominal setae. Two pairs of inner subdorsal minute setal bases on prothorax and 1 usually present on abdominal segment 6. Inner edge of orifice rim merging with margin at anterior angles of orifice, lip absent, a deep, broad invagination in anterior margin of orifice. Caudal ridges opposite orifice. On ventral surface a band of ridges extending inward from submarginal furrow, majority of ridges divided into irregularly shaped areas (more distinct in mature than in recently emerged pupae), absent from tracheal folds and area adjacent to abdominal tracheal fold. Minute spines in a band reaching from ridges to submedian area, present across tracheal folds; also present around mouthparts, adhesive sacs, and legs.

Type.—U.S.N.M. 56975. Ponce, Puerto Rico, from *Stigmaphyllon*.

Described from numerous unmounted specimens and 28 mounted ones from *Stigmaphyllon*;

S. sagraeanum A. Juss. (determined by C. V. Morton, U. S. National Herbarium), Hana-banilla Falls, near Cumanayagua, Santa Clara, Cuba, H. G. Myers, April 7, 1925; *Stigmaphyllon* sp., Ponce, Puerto Rico, Martorell and Wolcott, May 20, 1937 (including holotype).

***Crenidorsum diaphanum*, n. sp.**

Figs. 29, 30

Waxy secretion not observed. Differing from *C. magnisetae* as follows: Derm membranous, colorless. Marginal teeth slightly wider than long, their sides moderately converging, approximately 15 in 100μ . Submarginal teeth very faint, in basal part of marginal teeth. Rows of scallops terminating on sixth abdominal segment, 36 or 37 (observed) in each row. Submedian meso- and metathoracic setae absent; cephalic and eighth abdominal ones $30-40\mu$ long, and $6-8\mu$ in diameter at base; eighth abdominal ones located about twice as far from vasiform orifice as from posterior suture, area around their bases not swollen; caudal setae located just before bases of mar-

ginal teeth, as far apart as innermost point of bases of eighth abdominal ones. Disk pores outside scallops about one-third as numerous as scallops; submedian disk pores absent from thorax. Vasiform orifice approximately its length from posterior suture and about one and one-half times its length from body margin; a faint indication of an invagination between rim and lip at anterior end of orifice. Ventrally no submarginal furrow; ridges extending inward from margin except in and on each side of tracheal folds, majority of them divided into irregularly shaped areas; a band of minute spines mesad of ridges, extending to submedian area on abdomen, none or few mesad of legs and around adhesive sacs; very minute spine-shaped markings in median area of abdomen.

Type.—U.S.N.M. 56976. West of Cabaret, Haiti, from *Coccoloba*.

Described from three specimens from *Coccoloba rotundifolia* Meissn., west of Cabaret, Haiti, E. C. and G. M. Leonard, January 12, 1929, U.S.N.H.

ZOOLOGY.—*Malacobdella minuta*, a new commensal nemertean.¹ WESLEY R. COE. Osborn Zoological Laboratory, Yale University, and Scripps Institution of Oceanography, University of California. (Communicated by WALDO L. SCHMITT.)

The new species of nemertean described herein is of interest because it presents several morphological deviations from the three previously described representatives of the order Bdellonemertea. This order contains but a single genus, *Malacobdella*, the species of which are highly specialized for a commensal life within the mantle or pulmonary cavities of various mollusks. One of these species, *Malacobdella grossa* (O. F. Müller), which is specifically identical with *M. mercenaria* and *M. obesa* Verrill, is widely distributed in pelecypods on the coasts of Europe and on both the Atlantic and Pacific coasts of North America. Another species (*M. japonica* Takakura) has been reported only from the coasts of Japan. The third species was found in the

pulmonary cavity of a fresh-water snail in Chile.

DESCRIPTION

***Malacobdella minuta*, n. sp.**, is a dwarf form, with a combination of characteristics by which it is easily distinguished from *M. grossa*, also found on the coast of California, as well as from *M. japonica*. It differs particularly from *M. grossa* in its small size when mature, in having few and relatively large gonads, arranged in a single irregular row, in having dorsolateral nephridiopores, and in the short proboscis chamber. The chief distinctions from *M. japonica* are size, arrangement and number of gonads, length of proboscis sheath, and position of posterior nerve commissure. Minor differences from each of these species are indicated in the following paragraphs:

Length of sexually mature type specimen only 5 to 8 mm, according to state of contrac-

¹ Received September 1, 1944. Contributions from the Scripps Institution of Oceanography, New Series No. 243.



1945. "A new genus and twelve new species of Neotropical whiteflies (Homoptera Aleyrodidae)." *Journal of the Washington Academy of Sciences* 35, 55–65.

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