

STUDIES ON THE FAUNA OF CURAÇAO AND OTHER  
CARIBBEAN ISLANDS: No. 79.

**OPISTHOBRANCHS FROM THE LESSER ANTILLES**

by

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Thanks to help of the Government of the Netherlands, Dr. DIVA DINIZ CORRÊA, a lecturer in our Department, was able to work at the "Caraïbisch Marien-Biologisch Instituut" (Caribbean Marine Biological Institute; Carmabi) Curaçao, from January to July 1962. Besides actinians and nemerteans for her own studies she collected opisthobranchs for us, sketched them alive, and took notes of their shape and colours.

Furthermore, Dr. PIETER WAGENAAR HUMMELINCK, of Utrecht, has sent us his collections, with exception of the Aplysiidae, caught in 1930, which were already studied by ENGEL (1936).

There are 55 identifiable species in the two collections, including the Lamellariacea which, since the Challenger Report, have traditionally been studied together with the Opisthobranchia. (See Table 1.)

The indication (C) or (H) after the date signifies Dr. CORRÊA's or Dr. HUMMELINCK's collection; the latter's fieldnotes and sketches of living slugs are indicated by (PWH). His station numbers (H 1056Aa, H 1320, etc.) under which a description of the habitat can be found, refer to his list of 1930-1949 localities in the 4th volume of this series, or to a forthcoming paper, in which the 1955 localities will be described.

The material which was returned to Dr. HUMMELINCK has been presented by him to the Zoological Museum at Amsterdam (Director: Prof. Dr. H. ENGEL).

## LIST OF SPECIES CLASSIFIED IN THE PRESENT PAPER

## Subclass OPISTHOBRANCHIA

## Order CEPHALASPIDEA

## Suborder SCAPHANDRACEA

## Family ATHYIDAE

1. *Haminoea elegans* (Gray, 1825)

## Suborder PHILINACEA

## Family AGLAJIDAE

2. *Chelidonura hirundinina* (Quoy & Gaimard, 1833) Fig. 9
3. *Chelidonura evelinae* Marcus, 1955

## Suborder PELTACEA

## Family RUNCINIDAE

4. *Ildica divae*, spec. nov. Fig. 1-7

## Order ANASPIDEA

## Family APLYSIIDAE

## Subfamily Aplysiinae

5. *Aplysia* (*Pruvotaplysia*) *parvula* Mörch, 1863
6. *Aplysia* (*Varría*) *brasiliána* Rang, 1828
7. *Aplysia* (*Varría*) *cervina* (Dall & Simpson, 1901)
8. *Aplysia* (*Varría*) *dactylomela* Rang, 1828

## Subfamily Dolabriferinae

9. *Dolabriferá dolabriferá* (Rang, 1828)
10. *Phyllaplysia engeli* Marcus, 1955

## Subfamily Notarchinae

11. *Stylocheilus longicauda* (Quoy & Gaimard, 1824) Fig. 10-21
12. *Bursatella leachii pleii* (Rang, 1828)

## Order ASCOGLOSSA

## Suborder OXYNOACEA

## Family OXYNOIDAE

13. *Oxynoe antillarum* Mörch, 1863

## Family LOBIGERIDAE

14. *Lobiger souverbiei* P. Fischer, 1856

## Suborder ELYSIACEA

## Family POLYBRANCHIIDAE

15. *Polybranchia viridis* (Deshayes, 1857) Fig. 63
16. *Cyerce antillensis* Engel, 1927 Fig. 22-24

## Family STILIGERIDAE

## Subfamily Stiligerinae

17. *Stiliger* (*Stiliger*) *vanellus* Marcus, 1957
18. *Stiliger* (*Ercolania*) *costai* Pruvot-Fol, 1951 Fig. 25-26

## Subfamily Hermaeinae

- 19.
- Hermaea (Placida) dendritica*
- (Alder & Hancock, 1843)

## Family ELYSIIDAE

20. *Elysia ornata* (Swainson, 1840) Fig. 27–28, 64  
 21. *Elysia papillosa* Verrill, 1901 Fig. 29  
 22. *Elysia cauze* Marcus, 1957  
 23. *Tridachia crispata* Mörch, 1863

## Order NOTASPIDEA

## Suborder PLEUROBRANCHACEA

## Family PLEUROBRANCHIDAE

## Subfamily Pleurobranchinae

24. *Berthella agassizii* (MacFarland, 1909)  
 25. *Pleurobranchus (Pleurobranchus) areolatus* Mörch, 1863

## Order NUDIBRANCHIA

## Suborder DORIDACEA

## Section Eudoridacea

## Tribe Cryptobranchia

## Family DORIDIDAE

## Subfamily Chromodoridinae

26. *Cadlina rumia* Marcus, 1955  
 27. *Chromodoris binza*, spec. nov. Fig. 30–31

## Subfamily Doridinae

- 28.
- Doris bovina*
- Marcus, 1955

## Subfamily Discodoridinae

29. *Peltodoris hummelincki*, spec. nov. Fig. 32–35  
 30. *Discodoris mortenseni*, spec. nov. Fig. 36–39

## Subfamily Halgerdinae

- 31.
- Aphelodoris antillensis*
- Bergh, 1879 Fig. 40–42

## Tribe Phanerobranchia

## Superfamily Nonsuctorina

## Family POLYCERIDAE

32. *Polycerella conyna* Marcus, 1957  
 33. *Polycera herthae*, spec. nov. Fig. 43–46

## Section Porostomata

## Family DENDRODORIDIDAE

- 34.
- Dendrodoris krebsii*
- Mörch, 1863

## Suborder DENDRONOTACEA

## Family SCYLLAEIDAE

- 35.
- Scyllaea pelagica*
- Linné, 1758 Fig. 65–66

## Family HANCOCKIIDAE

- 36.
- Hancockia ryrca*
- Marcus, 1957

## Family DOTOIDAE

37. *Doto cinerea* Trinchese, 1881  
 38. *Doto pita* Marcus, 1955  
 39. *Doto divae* Marcus, 1960 Fig. 67  
 40. *Doto chica* Marcus, 1960  
 41. *Doto doerga*, spec. nov. Fig. 47-51

## Suborder EOLIDACEA

## Tribe Pleuroprocta

## Family CORYPHELLIDAE

- 42.
- Coryphella dushia*
- , spec. nov. Fig. 52-54

## Tribe Acleioprocta

## Family FIONIDAE

- 43.
- Fiona pinnata*
- (Eschscholtz, 1831)

## Family CUTHONIDAE

44. *Catriona tina* Marcus, 1957 Fig. 55-56, 68  
 45. *Catriona maua* Marcus, 1960

## Tribe Cleioprocta

## Family FACELINIDAE

46. *Learchis poica* Marcus, 1960  
 47. *Moridilla kristenseni*, spec. nov. Fig. 57-60  
 48. *Phidiana lynceus* Bergh, 1867

## Family GLAUCIDAE

- 49.
- Glaucus atlanticus*
- Forster, 1777

## Family FAVORININAE

## Subfamily Facalaninae

- 50.
- Dondice occidentalis*
- (Engel, 1925)

## Subfamily Favorininae

51. *Nanuca sebastiani* Marcus, 1957  
 52. *Favorinus branchialis carneus* (Alder & Hancock, 1855) Fig. 61  
 53. *Favorinus auritulus* Marcus, 1955

## Subclass PROSOBRANCHIA

## Order MESOGASTROPODA

## Superfamily Lamellariacea

## Family LAMELLARIIDAE

54. *Lamellaria perspicua perspicua* Linné, 1758  
 55. *Lamellaria perspicua mopsicolor* du Bois-Reymond Fig. 62  
 Marcus, 1958

Table 1. LOCALITIES OF THE OPISTHOBRANCHS  
treated in this paper.

C = new material collected by DIVA DINIZ CORRÊA (1962)  
H = new material collected by P. WAGENAAR HUMMELINCK (1930-1955)  
h = material previously collected by the same (1930), cf. ENGEL 1936  
v = material collected by C. J. VAN DER HORST (1920), cf. ENGEL 1925, 1927  
m = material collected by T. MORTENSEN (1916)

Species	Localities													
	Aruba	Curaçao	Bonaire	Guanta (Ven.)	Cubagua	Tobago	Aves	Antigua	St. Kitts	St. Barts	St. Martin	Anguilla	Bimini	Atlantic Ocean
1 <i>Haminoea elegans</i>		C		H										
2 <i>Chelidonura hirundinina</i>		C												
3 <i>Chelidonura evelinae</i>		CH												
4 <i>Ildica divae</i>		C												
5 <i>Aplysia parvula</i>		CH		Hh										
6 <i>Aplysia brasiliiana</i>	H													
7 <i>Aplysia cervina</i>	H													
8 <i>Aplysia dactylomela</i>	H	Hh		h										
9 <i>Dolabrifera dolabrifera</i>	Hh	CHh		Hh										
10 <i>Phyllaplysia engelsi</i>		C												
11 <i>Stylochelus longicauda</i>	H	CHh		Hh										
12 <i>Bursatella leachii pleii</i>	H													H
13 <i>Oxynoe antillarum</i>		C												
14 <i>Lobiger souverbiei</i>		C												v
15 <i>Polybranchia viridis</i>		C												v
16 <i>Cyerce antillensis</i>		C												v
17 <i>Stiliger vanellus</i>		CH												v
18 <i>Stiliger costai</i>		C												
19 <i>Hermaea dendritica</i>		C												
20 <i>Elysia ornata</i>		C												v
21 <i>Elysia papillosa</i>		C												H
22 <i>Elysia cauae</i>		C												
23 <i>Tridachia crispata</i>	H	H												
24 <i>Berthella agassizii</i>	H	CH												v
25 <i>Pleurobranchus areolatus</i>		C												
26 <i>Cadlina rumia</i>		C												
27 <i>Chromodoris binza</i>		C												
28 <i>Doris bovina</i>		CH												
29 <i>Peltodoris hummelincki</i>	H	CH												
30 <i>Discodoris mortenseni</i>		C												
31 <i>Aphelodoris antillensis</i>		C												
32 <i>Polycerella conyna</i>		C												
33 <i>Polycera herthae</i>		C												
34 <i>Dendrodoris krebssii</i>		C												
35 <i>Scyllaea pelagica</i>		C												
36 <i>Hancockia ryrca</i>		C												
37 <i>Doto cinerea</i>		C												
38 <i>Doto pita</i>		C												
39 <i>Doto divae</i>		C												
40 <i>Doto chica</i>		C												
41 <i>Doto doerga</i>		C												
42 <i>Coryphella dushia</i>		C												
43 <i>Fiona pinnata</i>		C												
44 <i>Catriona tina</i>	H													
45 <i>Catriona maua</i>		C												
46 <i>Learchis poica</i>		C												
47 <i>Moridilla kristenseni</i>		C												
48 <i>Phidiana lynceus</i>		C												
49 <i>Glaucus atlanticus</i>	H													
50 <i>Dondice occidentalis</i>		C												
51 <i>Nanuca sebastiani</i>		C												
52 <i>Favorinus branchialis carneus</i>		C												
53 <i>Favorinus auritulus</i>		C												
54 <i>Lamellaria perspicua perspicua</i>		C												
55 <i>Lamellaria perspicua mopsicolor</i>		C												
Totals on Netherlands Antilles	13	43	15									6		

### 1. *Haminoea elegans* (Gray, 1825)

PILSBRY 1893, p. 355; MARCUS 1957a, p. 395; MARCUS 1958b, p. 35.

CURAÇAO: Piscadera Baai, from *Thalassia*, 5.-9.IV.1962 (C), 26 snails of different sizes.

BONAIRE: Paloe Lechi (= Playa Lechi), 24.II.1949 (H 1056Aa), 1 small specimen.

Further distribution: Southeast Florida and the West Indies (ABBOTT 1955, p. 278); Brazil, Rio de Janeiro and coast of S. Paulo.

According to modern conchologists (PERRY & SCHWENGEL 1955, p. 193; ABBOTT, l.c.; WARMKE & ABBOTT 1961, p. 142) the records from the west coast of Florida to Texas refer to *Haminoea succinea* (Conrad, 1846).

### 2. *Chelidonura hirundinina* (Quoy & Gaimard, 1833) Fig. 9

PILSBRY 1895, p. 34; BERGH 1900a, p. 213 (var. *elegans*); PRUVOT-FOL 1934, p. 29; BABA 1949, p. 22, 124; RISBEC 1951, p. 131; BABA & ABE 1959, p. 279; MACNAE 1962, p. 194.

CURAÇAO: Piscadera Baai, from *Thalassia*, 2.III.1962 (C), 1 spec.

Further distribution: Indo-Pacific from Mozambique to Japan, New Caledonia, and New South Wales, Port Jackson (ANGAS 1867, p.116, pl.13 (fig. 32: *Ch. adamsi*)).

This first Atlantic specimen of *Ch. hirundinina* has slight differences in colour from typical Indo-Pacific representatives (BABA 1949, pl. 2 fig. 4; 1958, frontispiece): the median and lateral blue lines are interrupted, and the blue of the tails is also less intense. The golden-yellow outer lines are not quite complete, and the two yellow triangles on either side in front are replaced by two parallel transverse streaks pointing obliquely upwards.

The animal was 4 mm long alive, hence quite young. The 0.6 mm-long, opaque, white, definitive shell (Fig. 9) stands out over the 0.4 mm-long brown, transparent, larval shell. In RISBEC's mature, 17 mm-long specimens the shell measured 2 mm.

### 3. *Chelidonura evelinae* Marcus, 1955

MARCUS 1955, p. 95; 1960a, p. 140; MARCUS 1962b, p. 451.

CURAÇAO: Sta. Marta Baai, creek, J. S. Zaneveld leg., 7.XI.1954 (H 1320), 1 slug; id., first lagoon, 24.II.1955 (H 1321), 1 spec.; Piscadera Baai, in front of the Carmabi, from *Padina* and *Halimeda*, II.-III.1962 (C), 3 small spec.; id., VI.1962 (C), 1 adult and 2 small spec.

LA FOURCHE, W of St. Barts: 2.VI.1949 (H 1124), 1 slug.

Further distribution: Florida, Upper Long Reef, Dade Co.; Biscayne Bay near Miami; Virgin Islands, St. John; Brazil, coast of S. Paulo.

One preserved slug from Santa Marta Baai was 50 mm long, 25 mm broad, and 20 mm high, hence considerably larger than the animals previously seen, whose length alive was up to 40 mm.

In the young, 3–4 mm-long animals, the whitish dorsal pattern appeared in the form of three concentrated transverse bands. Besides blue, as in the original material, the spots on the borders of parapodia and mantle lobes were white or orange.

*Chelidonura africana* PRUVOT-FOL (1953, p. 31) from Dakar and the Atlantic coast of Morocco, and *Ch. mediterranea* SWENNEN (1961, p. 44) from the south coast of Turkey, can be added to the two present species from the West Atlantic of this principally Indo-Pacific genus.

4. ***Ildica divae*, spec. nov.** Figs. 1–7

CURAÇAO: Piscadera Baai, on algae from the bottom or from the panels hanging from the pier of the Carmabi, also from *Thalassia*, II.–IV. 1962 (C), 7 spec.

Living snails (Fig. 1) were 1.5 mm long and about 0.5 mm broad. They were brown, also on the sole. A furrow between notum and underside is light. The tail stands out behind the bilobate notum. The animals had dried and were strongly contracted (Fig. 2), so that the shell was exposed in the notal notch. This shell (Fig. 4) measures about 0.2 mm. It is cup-shaped and forms one whorl which ends with a wide aperture. To the right of it lies the gill. In a clarified specimen (Fig. 3) the black eyes appear near the anterior end, farther behind the gizzard plates, and two rows of eggs are seen in the gonad, followed by the female gland mass.

The jaw plates are composed of rhomboid platelets (Fig. 5). The radula contains 14 rows, each with 1 lateral tooth on either side of the central one (Fig. 6). The lateral teeth are hooks with broad bases. Their aspect is extremely variable, according to their position. The broad cusp of the rhachidian tooth is notched in the middle and bears a row of very small denticles. Of the four gizzard plates two have 7 and two 8 ridges with dentate borders (Fig. 7).

The structure of the gill (Fig. 8) was examined in a specimen of a runcinid from the littoral zone of S. Paulo. We had received it from the Oceanographic Institute of the University of S. Paulo stained with carmine and mounted in Canada balsam. As the presence of a shell and its type cannot be ascertained in such a preparation, the animal cannot be classified; but its gill, single also in the snails from Curaçao, can complete the description of the latter. The gill lies under the notum to the right of the anus and slightly dorsal, receives blood from the perirectal sinus (si), and passes it to the heart (h). It is a dorso-ventrally compressed ctenidium of the plicate or folded type. In *Runcinella zelandica* ODHNER (1924, p. 46) there are 2 plicate, laterally compressed gills, one on each side of the anus.

The species is named for Dr. DIVA DINIZ CORRÊA.

The holotype, an intact specimen, was sent to Dr. HUMMELINCK; the rest of the material is kept in the Department of Zoology, Faculty of Philosophy, University of S. Paulo.

The new species is assigned to *Ildica*, because *Ildica nana* BERGH (1889, p. 871) is the only other species of the family with an external shell. The material of *I. nana* was found in the stomach of a *Trevelyanana*, to-day *Gymnodoris*, near Mauritius. Its shell conforms with those reported from other runcinids, viz. *Runcina coronata* (Quatrefages, 1844) (VAYSSIÈRE 1885, p. 105), *R. africana* PRUVOT-FOL (1953, fig. 1e; GANTÈS 1956, p. 257), and *R. setoensis* BABA (1954, fig. 1B). These shells are discoid or longish platelets without whorls, and resemble that of *Pluscula cuica* MARCUS (1953, p. 178, pl. 8 fig. 45-46), and the secondary shell of *Phyllaplysia engeli* MARCUS (1957b, fig. 4). *Ildica divae* is the first runcinid with a true larval shell. In shape, its radular teeth are similar to those of *Runcina elioti* BABA (1937, p. 203), a species with a ctenidium of several plumes and without a shell.

Two other runcinids were reported from the tropical West Atlantic: *Runcina prasina* (MÖRCH, 1863, p. 42; BERGH 1872a, pl. 24 fig. 27-29) from the Virgin Islands, and *R. inconspicua* VERRILL (1901, p. 28) from Bermuda. Neither has a shell, and the colour, especially that of *R. prasina*, differs widely from that of *I. divae*.



PRUVOT-FOL (1954, p. 55) thinks that *R. calaritana* Colosi, 1915, is a synonym of *coronata*, but the radula (STARMÜHLNER 1955, fig. 4) is different.

### 5. *Aplysia (Pruvotaplysia) parvula* Mörch, 1863

ENGEL 1927, p. 90, fig. 4-6; ENGEL 1936a, p. 15, fig. 8-14; EALES 1960, p. 287.

ARUBA: N of Seroe Colorado (= Seroe Corrá), Oostpunt, 2.V.1955 (H 1309), 1 spec.

CURAÇAO: Plaja Hoeloe, S of St. Kruis Baai, 28.X.1948 (H 1023), 2 spec.; Piscadera Baai, among algae growing on the pillars of the pier of the Carmabi, IV.1962 (C), 5 spec.

KLEIN BONAIRE: W point, 28.III.1955 (H 1367), 4 spec.

Further distribution: In all warm and warm-temperate seas from approximately Lat. 40° N to 40° S. In the Netherlands Antilles already recorded from Bonaire (ENGEL 1936a).

The shell of the biggest (40 mm long) of the sea-hares from Piscadera Baai was overgrown with algae. Dark secretion was expelled during narcotization. The large oval mantle foramen is rimmed with black (var. *nigrocincta* v. Martens, 1880), as in our specimen from Bahia, coast of Brazil (MARCUS 1958b, p. 44).

Living animals of this species rarely reach a length of more than 60 mm.

### 6. *Aplysia (Varría) brasiliána* Rang, 1828

MARCUS 1957c, p. 4; EALES 1960, p. 297.

ARUBA: Rincón, N of Boca Grandi, 7.V.1955 (H 1310), 2 slugs.

CUBAGUA: NW coast, 21.V.1936 (H), 2 spec.

Further distribution: West Atlantic, from New Jersey to Brazil, southwards to Sta. Catharina; East Atlantic, Ghana and St. Helena.

From EALES' description we quote the following principal characters: "high and massive, with elongated head and neck, but strongly contractile. Much swollen posteriorly. Colour very variable, brown, bottle green, greyish or purplish black, unicoloured or spotted, or with black pigment forming a fine veining or network. Alive up to 270 mm long".

## 7. *Aplysia (Varria) cervina* (Dall & Simpson, 1902)

MACFARLAND 1909, p. 38; ENGEL 1936a, p. 13; MARCUS 1959a, p. 3; MARCUS 1960a, p. 143; EALES 1960, p. 299; MARCUS 1962b, p. 451.

ARUBA: Rincón, N of Boca Grandi, 7.V.1955 (H 1310), 1 spec.

Further distribution: Curaçao, Rifwater (ENGEL, 1936a); Atlantic seaboard from eastern U.S.A., e.g. South Carolina and Florida, through Central America and the West Indies to Brazil, coast of Alagoas and S. Paulo.

Characterized by the scattered dark brown spots on the sides of the body, which is smaller than in *brasiliانا*. The living sea-hares of *cervina* attain a length of about 100 mm.

## 8. *Aplysia (Varria) dactylomela* Rang, 1828

ENGEL 1927, p. 84, fig. 1-2; ENGEL 1936a, p. 5, fig. 1-7; EALES 1960, p. 307; MARCUS 1962b, p. 452.

ARUBA: Palm Beach, 3.I.1949 (H), 1 spec.

CURAÇAO: Knip Baai, 30.IV.1949 (H 1018), 1 spec.; Sta. Marta Baai, J. S. Zaneveld leg., 1.XI.1954 (H), 1 spec.; Spaanse Baai, 21.IV.1949 (H 1037), 1 spec.; S coast of Curaçao, Brother M. Realino Janssen leg., 16.XI.1947 (H), 1 spec.

ST. KITTS (= St. Christopher): Frigate Bay, 20.VII.1955 (H 1397), 2 spec.

ST. MARTIN: Great Bay, 3.VI.1955 (H), 1 spec.

ANGUILLA: N of Sandy Ground, 19.VI.1949 (H 1142), 1 spec.

Further distribution: Worldwide in warm seas. Not recorded from the Mediterranean Sea, and evidently rare (PILSBRY 1895, p. 88) on the tropical Pacific coast of the Americas.

A detailed description of colour pattern and measurements, based upon material collected by HUMMELINCK in Curaçao and Bonaire in 1930 is given by ENGEL: a painting of the living, crawling animal is reproduced as frontispiece in EALES' revision. According to EALES this species attains a length of more than 400 mm when alive.

## 9. *Dolabrifera dolabrifera* (Rang, 1828)

ENGEL 1927, p. 94, fig. 7-9 (*D. ascifera*); ENGEL 1936a, p. 29, fig. 16; EALES 1944, p. 7; MARCUS 1962b, p. 452.

ARUBA: Paardenbaai, reef, 28.IV.1955 (H 1303), 4 spec.; Boekoeti (= Bucuti), seaside, on *Porites*, 6.V.1955 (H 1006b), 4 spec.

CURAÇAO: Playa Frankie, Spaanse Put, 27.II.1955 (H 1317), 4 spec.; Sta. Marta Baai, third lagoon, 25.II.1955 (H 1323), 3 spec.; Sta. Marta Baai, Valentijn Baai, and Piscadera Baai, under blocks of dead corals, shallow water, I.-II.1962 (C), 10 spec.; ? Curaçao, W.I., J. Boeke leg. (H), 1 spec.  
 BONAIRE: Paloe Lechi, 4.IV.1955 (H 1056b), 1 spec.  
 ANTIGUA: Deep Bay, 17.VII.1955 (H 1393), 2 spec.  
 St. MARTIN: Great Bay, E shore, 11.VI.1949 (H 1126), 8 spec.

Further distribution: Circumtropical and circumsubtropical, but not yet recorded from the American Pacific coast. Hummelinck collected the species in 1930 on the coasts of Aruba, Curaçao and Bonaire.

This was the most common of the bulky opisthobranchs found during Dr. CORRÊA's stay in Curaçao. Her biggest specimens were 80 mm long and 40 mm broad. Egg ribbons similar to those of *Aplysia* were seen on 9. I. 1962. HUMMELINCK found the animals in shallow tide pools, under stones and coral fragments, noted that their colour corresponded with the environment, and observed their speed and contractibility (ENGEL 1936a).

#### 10. *Phyllaplysia engeli* Marcus, 1955

MARCUS 1955, p. 105; 1957b, p. 53.

CURAÇAO: Piscadera Baai, from *Thalassia* in the mangrove region, II.-III.1962 (C), 66 animals.

Further distribution: Brazil, coast of Pernambuco and S. Paulo.

Though generally 6 mm long or less when alive, some slugs attain 20 mm. The colour varies; it is greyish, greenish, yellowish, or whitish, with reddish and yellow dots. Magnified, the back shows longitudinal yellowish-green stripes alternating with white. Other slugs have brown dots and whitish, bluish or yellowish spots, surrounded first by a brown and outwards by a blue or white circle.

The tiny outermost denticle of the first lateral tooth MARCUS (1955, p. 106, fig. 33, tooth 1) is sometimes absent.

#### 11. *Stylocheilus longicauda* (Quoy & Gaimard, 1824) Figs. 10-21

ENGEL 1927, p. 107, fig. 21-25 (*Aclesia longicauda*, *A. polyomma*), p. 105-107, fig. 17-20 (? *A. nigra*); ENGEL 1936a, p. 57, fig. 24-43; EALES 1944, p. 18; BABA 1955, p. 39; MACNAE 1962, p. 197.

ARUBA: Paardenbaai, reef, 28.IV.1955 (H 1303), 4 spec.

CURAÇAO: Boca Santoe Pretoe, 12.III.1949 (H 1022a), 11 spec.; Boca Grandi, and Piscadera Baai, among algae growing on the piling of the Carmabi, and from *Thalassia* in the mangrove region, II.-V.1962 (C), 24 slugs; Plaja Djerimi, 29.I.1949 (H 1019A), about 20 young spec.

KLEIN BONAIRE: N shore, 30.III.1955 (H 1369), many spec.

BONAIRE: Paloe Lechi, 4.IX.1948 (H 1055), 1 spec.; Lac, Cay, 17.IX.1948 (H 1067), 1 spec.; Slagbaai, 3.IV.1955 (H 1380), 6 spec.

NORTH BIMINI (Bahamas): Laboratory dock, 20.VIII.1949 (H 1151), 2 spec.

Further distribution: Circumtropical, not yet recorded from the W coast of America. In the Netherlands Antilles already found at Bonaire and Curaçao by Hummelinck (ENGEL, 1936a).

It is perhaps still an open question whether single slugs of similar colour and pattern but of very different sizes and from widely distant coasts can be considered as belonging to one and the same species. ENGEL (1936a) did, though hesitating in several cases. Dr. CORRÊA's observation supports his view. At Piscadera Baai she found 2-20 mm-long slugs in February, and 90 mm-long ones at the end of May in the same place. The rapid growth of sea-hares is known (SI 1931, p. 96). Dr. CORRÊA's colour sketch shows the brown longitudinal lines, accurately compared with pencil strokes on rough paper (ENGEL 1936a, p. 58), and blue ocellar spots surrounded by orange circles. HUMMELINCK recorded similar patterns on his material from the same region (ENGEL 1936a). The secretion produced by the animals from Piscadera Baai was bluish.

The reproductive organs were described and illustrated by VAYS-SIÈRE (1906, p. 78-80, pl. 1 fig. 9-12bis), whose *Notarchus indicus* is not *N. indicus* Schweigger, 1820 (see BERGH 1902, p. 349; ENGEL 1936b, p. 113), but *Stylocheilus longicauda* (ENGEL 1936a, p. 57, 66; 1936b, p. 119).

The ovotestis (z) lies behind the digestive gland (h). The spermo-viduct runs forwards as in *Aplysia* (MARCUS 1959a, p. 9), with the same division into three sections: a thin gonadial part, an ampulla already widened by sperms in an 8 mm-long slug, and an outer section, EALES' "loop of the little hermaphrodite duct" (1921, fig. 18, 20, 1p). The winding gland is more dorsal than ventral; the spermatocyst is a very long tube intumescing in the middle. The duct of the spermatheca (bursa) is as long as the diameter of its vesicle. The distal section of the large hermaphrodite duct, i.e., the part

between entrance of bursal canal and common genital opening, is much folded entally, corresponding to the clustered gland of *Aplysia* (MARCUS 1959a, fig. 18). The whole distal section is as long as the one following it inwards, whose bounds are the entrance of the bursal duct and the separation of the vagina from the large hermaphrodite duct.

The young animals from Plaja Djerimi, Curaçao, were found in water 2.5–4 m deep on sandy bottom with eel grass and loose plants. They were from 0.65 to 2.5 mm long in preservation. Up to a body length of 1.5 mm they have a shell.

The smallest animal present (0.65 mm, Fig. 14) already has eyes as in our youngest stage of *Aplysia brasiliiana* (MARCUS 1957b, p. 10), its rhinophores are rolled, and the tentacles knoblike. The tail is 0.25 mm long, the head in part retracted under the shell. The latter is strongly vaulted, 0.6 mm long, 0.4 mm broad. Only its conchinous layer, with growth lines and diatoms and stalked Peritricha on the surface, is preserved. The shell is surrounded by a narrow pallial brim. Behind, the parapodia unite under the shell. The intestine, seen through transparency, is already thrown into its specifically characteristic loops, which become deeper with age.

A shell in the material from Piscadera Baai has preserved its calcareous layer (Fig. 19); it is 1 mm long, 0.65 mm broad, about 0.55 mm high, and also strongly vaulted. As the animal had dried out, its length cannot be given, but the brown longitudinal strokes which are preserved on the parapodia (Fig. 18), and the radula, which is in conformity with the material from Plaja Djerimi, vouch for our determination. The shell has two and a half smooth larval whorls with brown sutures; the patelloid shell grown beyond the larval shell has growth lines. Compared with *Aplysia brasiliiana* (MARCUS 1957b, p. 11), the larval whorls of *St. longicauda* are a little less numerous, but they are also turned to the ventral side as in that species and in the cephalaspideans which were mentioned in that reference.

In the biggest snail with shell from Plaja Djerimi (1.5 mm) the length of the tail is 0.4 mm. The 0.85 mm-long shell is not covered by the parapodia.

The rods of the mandibles show a fine terminal denticulation in the young animals (Fig. 20). The radula (Fig. 21) of a 1 mm-long

specimen (Fig. 15) had 15 rows with 3 lateral teeth on either side of the rhachidian tooth in the oldest rows, increasing to 8 in the youngest ones. The rhachidian tooth already has its characteristic shape; the cusp of the lateral teeth is feathered, weaker on its inner, stronger on its outer side. The outermost teeth are plates without cusps. The lateral teeth of an adult radula (Fig. 12) differ widely in appearance from the teeth of this young one. Compared with figures of the adult radula in the literature, e.g. VAYSSIÈRE (1906, fig. 7-8: *Notarchus indicus*); BERGH (1908, pl. 12 fig. 12-15: *Aclesia erythraea*); ENGEL (1927, fig. 23: *Aclesia polyomma*; 1936a, fig. 37c, 38, 39, 42, 43); BABA (1936, fig. 5 A: *Notarchus stimpsoni*); and EALES (1938, fig. 7; 1944, fig. 13), our Figure 12 evidences the high variability of the radula in *St. longicauda* which, in this respect, corresponds with the other aplysiids.

On the basis of the present material, we can continue our comparison (MARCUS 1962a, p. 18) of the inner organs in *St. longicauda* and *St. citrinus* (RANG, 1828) from floating *Sargassum* and driftwood in warm water of the western Atlantic Ocean.

The separation of the purple gland into two areas is less distinct in *St. longicauda* than in *citrinus*. In the central nervous system there is only a difference of degree with respect to the pedal commissure, which is a little shorter in *longicauda* (Fig. 13, c). As we had presumed, the arrangement of the ganglia of the visceral loop does not involve specific characters. Two preserved slugs of *longicauda*, 8 and 12 mm in length, have connectives of about equal length between pleural and visceral ganglia, hence agree with EALES' figure 8 (1938). However, in a 35 mm-long slug the ganglia (Fig. 13, p, v) lie as in our dissected specimen of *citrinus* and in ENGEL's figure 24 (1927) of *Aclesia polyomma*, a synonym of *St. longicauda*.

Furthermore, the gizzard teeth are systematically insignificant. The dagger-shaped teeth in a single row (EALES 1944, p. 13) or in three rows (ENGEL 1927, p. 108) no longer separate *longicauda* from *citrinus*, because we have now found the same irregularly arranged cuticularized warts in *longicauda* as in *citrinus* (1962a, fig. 4). The very short alimentary canal of *St. citrinus* (1962a, p. 18, fig. 5) continues to be its most distinctive anatomical character, while the gut forms two complete loops around ovotestis and digestive gland

in *longicauda* (Fig. 11), as VAYSSIÈRE (1906, p. 75) described for his *Notarchus indicus*, whose identity with *St. longicauda* was mentioned above. In an 8 mm-long specimen of *longicauda* the intestine is already longer than that of a 23 mm-long *citrinus*.

A remnant of torsion is shown by the salivary glands of *longicauda* (Fig. 10). The anteriorly right gland (r) runs backwards under the central nervous system (d) to the left side, the left gland (k) over the nerve ring to the right. GUIART (1901, p. 85) observed a similar crossing in other tectibranchs. In *St. citrinus* the same phenomenon is recognizable but is less pronounced.

The penial armature of both species differs only with regard to the penial spines. These are indeed larger in *longicauda* (EALES 1938, fig. 9) than in *citrinus* (MARCUS 1962a, fig. 6). We found the spiny warts on the inner side of the penis sheath to be not all irregularly scattered but chiefly arranged in three rows, as in *citrinus*.

## 12. *Bursatella leachii pleii* (Rang, 1828)

EALES & ENGEL 1935, p. 292, 301; HENRY 1952, p. 8; MARCUS 1955, p. 101, 104.

ARUBA: Malmok, Arasji, 14.VIII.1955 (H 1301), 14 spec.

CURAÇAO: Piscadera Bay, crawling on a stone in shallow water in the inner part of the bay, 21.V.1962 (C), one 50 mm-long slug; two further animals, estimated to be 250 mm long, were seen crawling in the mud in the mangrove region, but were not preserved.

Further distribution: From the W coast of Florida (PILSBRY 1896, p. 148; HENRY, 1952) to the Greater and Lesser Antilles and Trinidad. Brazil, Rio de Janeiro, coast of S. Paulo, southern Rio Grande do Sul, about 32° S.

The specimen from Curaçao is as woolly as *Bursatella lacinulata* GOULD (1852, p. 223; 1856, pl. 16 fig. 269-269a). According to EALES & ENGEL (1935) this is not the rule in the West Indian subspecies. But the number of appendages varies, and many of them become inconspicuous in preserved material, owing to contraction. The specimen from Alligator Harbour, west coast of Florida, drawn by HENRY (1952, pl. 1 fig. A), is rather hairy too. In 1955 we maintained the subspecies *lacinulata*, but we really cannot distinguish it from *pleii*. Therefore we include the localities for *lacinulata* in the general distribution of *pleii*. Examination of the penis of our first woolly *lacinulata* proved the collar to be as drawn in

our figure 28 (1955) for *pleii*. The collar of both Brazilian slugs is somewhat reflected, so that the outer spines are seen on the inner side. We found the same condition in another, much less woolly, slug classified as *pleii*.

Several of the slugs from Aruba are mottled with black pigment.

### 13. *Oxynoe antillarum* Mörch, 1863

ENGEL 1927, p. 111, fig. 27.

CURAÇAO: Piscadera Baai, coming up from *Thalassia*, 28.III.1962 (C), 1 spec.

Further distribution: Curaçao, Caracas Baai, C. J. van der Horst leg. 1920 (ENGEL, 1927); Virgin Islands, St. Thomas (MÖRCH 1863, p. 27); Puerto Rico (WARMKE & ABBOTT 1961, p. 150).

The living animal was light brown with white spots. Parapodia and tail bore white papillae, and the outer or ventral surface of the parapodia had white and black dots.

Though ENGEL (1927) stressed the variability of the shell in *Oxynoe*, JAUME (1945, p. 22) separated a species from Cuba whose shell is as long and broad as in MÖRCH's material, but a little narrower at the base.

### 14. *Lobiger souverbiei* P. Fischer, 1856

ENGEL 1927, p. 112; MARCUS 1957a, p. 398.

CURAÇAO: Piscadera Baai, 19.VI.1962 (C), 1 spec. from algae.

Further distribution: Curaçao, Caracas Baai, C. J. van der Horst leg. 1920 (ENGEL 1927, p. 112); Guadeloupe (FISCHER 1856, p. 273); Puerto Rico (WARMKE & ABBOTT 1961, p. 150); Tortugas (THIELE 1910, p. 123); Brazil, Guarujá, east of Santos, from *Caulerpa racemosa* (MARCUS, l.c.).

Like the Mediterranean *L. serradifalci* (Calcara, 1840), *L. pilsbryi* SCHWENGEL, 1941 (p. 37-40; PERRY & SCHWENGEL 1955, p. 195), dredged in 11 m off Sanibel island, west coast of Florida, also has a shell a little bigger than that of *souverbiei*. The subgenus *Dipterophysis* Pilsbry (1896, p. 168; PRUVOT-FOL 1954, p. 173 and note 1) is certainly based upon a defective animal (BERGH 1900b, p. 189, note 4; ENGEL 1927, p. 113).



15. **Polybranchia viridis** (Deshayes, 1857) Fig. 63

ENGEL 1927, p. 115, fig. 33-36 (*Phyllobranchus viridis*).

CURAÇAO: Piscadera Baai, inner and outer part, from various algae, II., IV.-VI.1962 (C), 4 slugs.

BOINAIRE, Kralendijk, near Pasanggrahan, 5.IX.1930 (H 1057), 1 spec. (Fig. 63).

Further distribution: Curaçao, Caracas Baai and Spaanse Water, from the coral *Porites furcata*, C. J. van der Horst, 1920; Guadeloupe, St. Thomas, Antilles.

The present slugs from Curaçao attained a length of 70 mm alive; one of them was dark greyish, the others light greyish-green. They have whitish cones or knobs on their back and the cerata, as already observed by BERGH (1871, p. 93) and ENGEL (1927, p. 116).

The juvenile specimen from Bonaire (Fig. 63) was "colourless except for the black-pigmented fields behind the eyes and the brownish tint showing through the skin of the cerata. One of the shed cerata had colourless bodies near its margin and smaller yellowish grains towards the base" (PWH).

*Polybranchia pellucida* PEASE (1860, p. 141) is a "species inquirenda". As no mention is made of a transverse groove in the sole, we follow SWENNEN (1961, p. 57) and assume that it has none. Therefore we use PEASE's generic name instead of the well characterized, but later and preoccupied (O'DONOGHUE 1929, p. 737; NEAVE, Nomencl. zool. 3, 1940, p. 740) *Phyllobranchus* ALDER & HANCOCK (1864, p. 145).

16. **Cyerce antillensis** Engel, 1927 Figs. 22-24

ENGEL 1927, p. 117, fig. 38.

CURAÇAO: Plaja Hoeloe, S of St. Kruis Baai, 28.X.1948 (H 1023), 1 slug; Piscadera Baai, principally in its outer part, coming up from *Halimeda*, and under a stone at a depth of about 1.2 m, III.-VI.1962 (C), 27 spec.; Fuik Baai, Newport Bath, 20.XI.1948 (H 1039), 5 spec.

Further distribution: Curaçao, C. J. van der Horst, 1920; Tobago.

Dr. CORRÊA's drawings of several living slugs (Fig. 22) show flattened cerata of various sizes with round ends and smooth or indented borders, resembling white-oak leaves. The cerata are

inserted at a certain distance from the sides of the back. They were seen to contract after having fallen off, just as was observed in the Siboga material of an undetermined *Cyerce* (BERGH 1905, p. 80, pl. 2 fig. 17). There are up to 10 big cerata on each side, and numerous smaller ones between them. The hind end is pointed in our slugs.

The present ample material shows a great diversity in the distribution of dark pigment. Some specimens are quite transparent, especially small ones. In others, only the axes of the rhinophores are dark, leaving their tips white. The transparent cerata often have a dark base and a dark spot near the tip or in the middle. On the back a thin pattern of dark pigment accompanies the vessels. One specimen was described as being brick-red in colour when alive, and had a deep black pattern in preserved condition. A yellowish or whitish dorsal centre contrasts with a dark brown or brick-red back. The sole is colourless. The central area of the back bears pointed papillae, as in PELSENEER's Mediterranean *jheringi* (1892, p. XIX; 1894, p. 50).

The cutting edge of the radular tooth is finely denticulate (Fig. 23). The penis bears a cuticular stylet (Fig. 24). This bulbar tube with subterminal opening is compatible with ENGEL's drawing (fig. 38 j). Small specimens had no stylet.

ENGEL distinguished his species from PELSENEER's *jheringi* by the different shape of the cerata and a different place of insertion. These characters depend upon varying contraction when the slugs were preserved. The chitinous elements, teeth and stylet, however, justify distinction of the Antillean from the Mediterranean species. The teeth of *antillensis* are shorter and broader than those of the Mediterranean species, which have extremely coarse denticles bent backwards (SWENNEN 1961, fig. 10 g-h). The straight penial stylet of the former has a slightly bulbar base and a wide opening; that of the latter is funnel-shaped and strongly curved (ibid., fig. 10 e).

The specific name of the Mediterranean species must be *crystallina* TRINCHESE (1881b, p. 216), as was revealed by PORTMANN (1958, p. 407). The generic name, however, continues to be *Cyerce* BERGH (1871, p. 98). SWENNEN (1961, p. 57) is right in completely abandoning *Lobifera* Pease, 1866. It was introduced as a substitute for *Polybranchia* Pease, 1860, because PEASE no longer considered the

appendages as branchiae. Hence the name *Lobifera* is a synonym from its introduction and cannot be used again.

17. ***Stiliger (Stiliger) vanellus* Marcus, 1957**

MARCUS 1957a, p. 402; MARCUS 1960a, p. 144.

CURAÇAO: Piscadera Baai, from *Thalassia* and growth on mangrove roots, I., III.-IV.1962 (C), 5 spec.

Further distribution: Florida, Miami area, Virginia Key; Brazil, coast of S. Paulo.

Dr. CORRÊA's description of shape and pigmentation of the living animals tallies well with our first record, but the present slugs are larger (up to 5 mm). The body is black, the sole light; the up to 9 smooth cerata on each side bear scattered melanophores, like the slug from Miami.

18. ***Stiliger (Ercolania) costai* Pruvot-Fol, 1951** Figs. 25-26

PRUVOT-FOL 1951b, p. 70; PRUVOT-FOL 1954, p. 196; WIRZ-MANGOLD & WYSS 1958, p. 29; MARCUS 1960a, p. 146.

ST. KITTS: Frigate Bay, 20.VII.1955 (H 1397), 1 slug.

Further distribution: Florida, Miami area, Key Largo; western Mediterranean Sea.

The preserved, 4.5 mm-long slug has shed most of its larger cerata (Fig. 26), which are up to 1.2 mm long and were drawn in their natural position on the left side in Fig. 25. The present specimen is more like the original material (PRUVOT-FOL 1951b, fig. 39) than the slug from Miami (MARCUS 1960a, fig. 22), though the big, sabot-shaped teeth are the same in all these slugs. In the present one there are 4, the largest of which is 0.35 mm long. The teeth constitute a safe character for classifying the species.

19. ***Hermaea (Placida) dendritica* (Alder & Hancock, 1843)**

BERGH 1886, p. 2; PRUVOT-FOL 1954, p. 186; MARCUS 1961b, p. 141.

CURAÇAO: Piscadera Baai, from *Thalassia* in the mangrove region, and among algae on the pillars of the pier of the Carmabi, II.-IV.1962 (C), 7 slugs.

Further distribution: North Carolina; coast of New England; Mediterranean Sea and eastern Atlantic Ocean, northwards to southern Norway, Bergen; southern and middle Japan.

While the species generally feeds on *Codium* (ALDER & HANCOCK 1848, fam. 3, pl. 40; PRUVOT-FOL, 1954; BABA 1955, p. 41), and has correspondingly green diverticula of the intestinal gland in the cerata, the present specimens had orange hepatic branches, sometimes quite dark, according to the digestive phase.

The type species of *Hermaea* Lovén, 1844, has no ramifications of the albumen gland in the cerata, whereas *dendritica* has. Accordingly, PRUVOT-FOL (1954) removed *dendritica* to *Placida* Trinchese, 1876. She ponders the necessity for replacing the customary name of the species (ALDER & HANCOCK 1843, p. 233) by *venosa* Lovén, 1844. ODHNER's reproduction (1907, pl. 3 fig. 28) of LOVÉN's figure shows that *venosa* and *dendritica* are indeed one and the same species, but the priority of *venosa* presumed by PRUVOT-FOL does not exist (see SHERBORN, Ind. An. 28, p. 6839).

## 20. *Elysia ornata* (Swainson, 1840) Figs. 27–28, 64

ENGEL 1927, p. 113, fig. 20–21; PRUVOT-FOL 1946, p. 32; MARCUS 1957a, p. 414.

CURAÇAO: Piscadera Baai, coming up from *Thalassia*, among algae growing on the pillars of the jetty of the Carmabi, and in the canals conducting water from the aquaria to the sea, II.–IV.1962 (C), 16 spec.

BONAIRE: De Hoop, S of Kralendijk, 31.X.1930 (H 1058a), 3 spec.

Further distribution: Tobago; St. Vincent; Bermudas.

Living slugs attained a length of 40 mm. The preserved specimens were smooth, yellow with black-rimmed parapodia and rhinophores, and jet-black round spots whose contours are sharp. The lips are not black. Outer side of parapodia densely spotted; towards the borders the dots become fewer, and also on the inner side. The sole is lighter than the rest of the body and bears smaller dots. The colour therefore agrees rather well with ENGEL's description, except for the orange band around the parapodia, which possibly faded out in the alcohol, though it was not mentioned in respect of the living animals either.

Colour description of a single, slightly narcotized, small specimen from Bonaire (Fig. 64): "Ground colour light brown; dorsal side of parapodia with greyish-brown patches; the sole is lighter than the rest of the body, and has round black grains scattered over it, the largest of which have a powdery rim. – Ventral side of parapodia with a narrow black rim, like a line drawn in pencil on rough paper; under this band is to be seen a narrow border of orange-golden brown, which becomes thinner at the extremities. – A similar 'graphite' band is also found on the rhinophores, and there too the border underneath is distinctly golden-brown. – Besides these black rims we find small black patches, especially in the mid-dorsal region, on the head (except for the rhinophores), and, only here and there, fragmentarily, on the parapodia. – Cream-coloured grains occur in isolation or in accumulations, especially near the base of the rhinophores and in the dorsal region. – Finally, in some places small, round, orange-brown grains are found scattered, which have nothing to do with the golden-brown border of parapodia and rhinophores." (PWH)

The edge of the radular tooth was smooth (Fig. 28) in two slugs examined, whose radulae were treated rapidly with KOH and then mounted in glycerine. ENGEL (1927, p. 114) saw a denticulation in specimens preserved in alcohol, but it disappeared in Canada balsam. Evidently the denticles, if they are present, are extremely tiny. The straight row of the oldest teeth in the ascus (Fig. 27) corresponds with that in *Elysia cauze* (MARCUS 1957a, fig. 43, as), and distinguishes *ornata* (Swains.) from the homonymous Indo-Pacific *Elysia ornata* (PEASE 1860, p. 36; BERGH 1905, pl. 13 fig. 22; RISBEC 1953, fig. 121 D, E). *Tridachia ornata* (Pease) WHITE (1952, p. 118) does not need a new name (MARCUS 1957a, p. 416), but is a synonym of *T. crispata*.

21. *Elysia papillosa* Verrill, 1901 Fig. 29

VERRILL 1901, p. 31, pl. 4 fig. 3.

CURAÇAO: Piscadera Baai, coming up from *Halimeda*, III.–IV. and VI. 1962 (C), 3 slugs.

Further distribution: Bermuda Islands, on calcareous algae.

Living animals are up to 12 mm long. The body is elongate and slender. Alive, the colour is light greyish-brown or greenish with darker rhinophores and with spots on the light-brown sole. The hind part of the body is yellowish or whitish. The outer side of the parapodia is brown, in various shades. In the preserved specimens small black outlets of glands were noted. White papillae occur on the

outer sides of the parapodia and the dorsal side of the rhinophores, whence they extend along the mid-line on the neck. The inner borders of the parapodia are opaque white. The radula contains 7 teeth in the ascending limb and about 15 in the descending limb. The cutting edge is finely serrulate (Fig. 29). The oldest teeth are heaped up in the ascus.

Orange-brown transverse bands on the back of the rhinophores were not mentioned by the present collector, but in our opinion their absence does not hinder the determination. *Elysia cauze* has no white parapodial border, its radular teeth have broad cusps with coarsely dentate edges, and end as a straight row (MARCUS 1957a, p. 405, fig. 43, as), as in *E. ornata* (Fig. 27). The latter as well as *E. subornata* VERRILL (1901, p. 29) may be minutely papillose too, but they differ from *papillosa* by their colour.

## 22. *Elysia cauze* Marcus, 1957

MARCUS 1957a, p. 405; MARCUS 1960a, p. 153.

ARUBA: Boekoeti, pool at lagoon side, 6.V.1955 (H 1304), 1 spec.

CURAÇAO: Schottegat, Parera near Pasanggrahan, 22.VIII.1948 (H 1034), about 15 spec.

BONAIRE: Lac, Poejito, 17.IX.1948 (H 1064b), 1 spec.

ST. MARTIN: Simson Bay, Lagoon, Flamingo Pond, 8.VI.1949 (H 1132), 1 spec.

Further distribution: Florida, Miami area, Virginia Key, on *Caulerpa*; Brazil, coast of S. Paulo, on *Caulerpa*.

In the comparison of the preceding species with the other papillose West Atlantic forms, disjunctive characters of *cauze* are mentioned. Further properties of *cauze* are: the outlets of glands on the outer side of the parapodia marked as small black rings, the oesophageal crop, and the large, conical penial papilla. The denticles of the radular tooth are blunt. The radula ends straight in the ascus. However, it formed a double spiral in a slug treated with potassium hydroxide, and hence this useful method for study of the teeth should be employed with caution when the topography of the whole organ is examined.

23. *Tridachia crispata* Mörch, 1863

MÖRCH 1863, p. 40; BERGH 1872a, p. 191; ENGEL 1927, p. 115, fig. 32; MARCUS 1960a, p. 153; MARCUS 1962b, p. 461.

ARUBA, N of Punta Braboe, W. of Oranjestad, 16.VI.1930 (H 1001); Paarden Baai, reef, 28.IV.1955 (H 1303).

CURAÇAO, N coast, Boca Grandi, 23.IV.1962 (C); Knip Baai, S side, 8.I.1949 (H 1017); Boca Lagoen, N side, 13.XI.1948 (H 1020); St. Kruis Baai, S side, 26.IV.1930 (H 1021); Sta. Marta Baai, 25.II.1955 (H 1323); id. II.1962 (C); Valentijn Baai, 30.I.1962 (C); Piscadera Baai, in front of the Carmabi, I., III.1962 (C); Spaanse Water, Brakke Put, J. S. Zaneveld leg., 19.I.1955 (H 1340); Fuik Baai, Duitse Bad, 2.III.1949 (H 1038); id. 17.IV.1949 (H 1038a); Fuik Baai, 20.XI.1948 (H 1039A).

KLEIN BONAIRE: E coast at landing place, 8.XI.1930 (H 1049a).

BONAIRE: Paloe Lechi, 24.II.1949 (H 1056Aa); id., 4.IX.1948 (H 1056C); id., 30.VIII.1948 (H 1056 Ca); De Hoop, 31.X.1930 (H 1058a); id., 11.XI.1930 (H 1058b); id., 10.IX.1948 (H 1058A); Lac, 5.X.1930 (H 1068).

St. MARTIN: Great Bay, Point Blanche Bay, 26.VI.1949 (H 1125). A total of about 85 slugs, generally occurring on rocky shores, sometimes with tidal pools, frequently under stones and between the basal parts of corals in the mid-tide and lower zone; also on sandy mud with rock debris.

Further distribution: Curaçao, Spaanse Water, C. J. van der Horst leg. 1920 (ENGEL 1927, p. 115); Venezuela; Tobago; British Honduras; Dry Tortugas; W coast of Florida, and Miami area.

Specimen from Aruba (Sta. 1001). – "Inner side of parapodia light grey-greenish with yellow-grey patches. Outer side dark-green, with many small, irregularly shaped, more or less sharply demarcated, yellow-white patches. Sides dark-green, with many clearly defined yellow-white patches. The margins are formed by a uniform green band, with a yellow-white band at the very edge. The head bears regular, cream-coloured spots, including a particularly large spot behind the rhinophores." (PWH)

2 Specimens from Klein Bonaire (Sta. 1049a) and Bonaire (Sta. 1058b). – "Sole dirty light-yellowish white. Underside of parapodia bright green, with large round spots of dirty light-yellow at the base. Margin orange-yellow, slightly greenish. Rhinophores orange-yellow. There are several opaque white patches on the back, the colour of which is very light. Furthermore, there are some narrow patches of bright orange-yellow here and there on the boundary between the edge and the rest. Only colours of animal: yellowish green, and yellow. Foot, head and rhinophores extremely light yellowish green." (PWH)

3 Specimens from Bonaire (Sta. 1058a). – "(1) Back with 16 large or small round white patches, some run together, roughly united in 7 groups. Ground colour light beige, hardly visible, entirely misted over with brown, darker towards the sides, leaving only a broad white margin on the parapodia. Here and there the base of the wings is violet-tinged. Underside of parapodia grey misted over with brown, most clearly tinged with violet; large round, white spots on the orange-brown base. Front and hind part generally creamy; also white on the head. – (2) Back without white

patches, uniform brown powdered with grey; somewhat darker brown towards the edges. No violet in marking. Edge bluish-white or cream, in part. Underside of parapodia: right, brown with cream-coloured margin; left, violet with cream-coloured margin; both show oval, cream-coloured patches at the base in the middle. – (3) Underside of parapodia brown, somewhat violet-grey towards the margin.” (PWH)

Specimen from Bonaire (Sta. 1068). – “Sole white. Outside of parapodia cream-coloured because the deep-brown ground colour has been largely replaced by big cream-coloured patches. Inner side of parapodia and dorsal region deep-brown, with whitish dots. Margin of parapodia somewhat violet, with a colourless extreme edge. This colour pattern is due to the occurrence of yellow, dark-brown and violet grains, in zones which may overlap each other more or less completely; all the coloured grains have disappeared from the hyaline, slimy extreme edge of the parapodia.” (PWH)

The biggest preserved specimen from Curaçao, Fuik Baai (H 1038a) is 68 mm long.

From our establishment of the specific name (1962b) we recapitulate that *schrammi* was not written by DESHAYES (1857), who introduced (p. 142) the name of the genus and proposed the name of Mr. SCHRAMM for the species. *T. schrammi* Desh. is merely the correct interpretation of DESHAYES' intention, and not a formally acceptable form.

#### 24. *Berthella agassizii* (MacFarland, 1909)

MACFARLAND 1909, p. 59; ENGEL 1927, p. 110, fig. 26 (*Bouvieria agassizi*); MARCUS 1955, p. 117; MARCUS 1957c, p. 20.

CURAÇAO: Piscadera Baai and Spaanse Water, under stones, III., VI.1962 (C), 4 spec.

Further distribution: Curaçao, Caracas Baai, C. J. van der Horst leg., 1920; Brazil, coast of Alagoas and S. Paulo.

Like the first animal from Curaçao, the present ones were also young, 8 mm long and 4 mm broad, and had 45 teeth in the half-row of the radula. Like young specimens from S. Paulo, they were greyish. Numerous brown stipples occur on hyponotum, gill, sole and underside of tentacles. Scattered brilliant white specks on the notum might be cutaneous glands.



25. **Pleurobranchus (Pleurobranchus) areolatus** Mörch, 1863

MÖRCH 1863, p. 29; BERGH 1897, p. 111; ABBOTT 1949, p. 73 (*P. atlanticus*); MARCUS 1962b, p. 466.

CURAÇAO: Piscadera Baai, under a stone in front of the Carmabi, 23.III.1962 (C), 1 spec.

ISLOTE AVES (W. of Dominica): N lagoon, 12.V.1949 (H 1114), 1 spec.

\* Further distribution: Barbados; Virgin Islands, St. Thomas; Florida Keys; from the area of Miami to SW Florida.

Alive, the adult animal from Curaçao was 35 mm long and nearly 20 mm broad. An irregular pattern of greyish brown, yellow and white consists of convex light areae brimmed with dark. The large sole was yellow. The shell is 5 mm long, 2.5 mm broad. The mandibular platelets have 2-4 denticles on each side. The radula contains 75 rows, with about 140 teeth in the half-row. The stomach was filled with compact masses of Globigerinae.

26. **Cadlina rumia** Marcus, 1955

MARCUS 1955, p. 119.

CURAÇAO: Caracasbaai, C. J. van der Horst leg., under stone, 8.V.1920 (H), 2 slugs.

ST. MARTIN: Great Bay, NE shore, 16.V.1949 (H 1127), 1 slug.

Further distribution: Brazil, coast of S. Paulo, near Ubatuba and at the island of S. Sebastião.

Colour pattern, labial armature, radula, and gills warrant determination of the material, though it had been dry.

27. **Chromodoris binza**, spec. nov. Figs. 30-31

CURAÇAO: Piscadera Baai, near its entrance, under stones with hydroids in shallow water, II.-III.1962 (C), 7 slugs.

The living animals (Fig. 30) were 6-10 mm long and measured 3.3-8.5 mm in preservation. They are principally blue. The back has a broad yellow or yellowish-white median band flanked by 5 pairs of oval blue areae. Farther to the side run orange longitudinal bands which separate the blue areae by transverse projections. Those in the

middle of the back meet in the mid-line, covering the yellow band. The orange bands also unite in front of and behind the yellow band. Here and along the sides, blue areas lie outside the orange bands. From the bands, blackish-blue dashes proceed, separating the outer blue areas and extending a little into the light-blue ground colour of the sides and the foot. Sometimes the light blue of the sides is whitish, and yellow stripes are inserted between the orange and blue zones. The 8 unipinnate gills and the rhinophores are light blue, each with a blackish-blue streak. The rhinophores have 15 perfoliations.

The grasping ring of the lips consists of bifid hooklets. The radula (Fig. 31) has 42 rows, with 37 teeth in the half-row. The rhachidian thickening (ce) is a small flat triangle without a cusp. The innermost lateral tooth (l) has one inner and 4 outer denticles; the outward following ones (s, n) have only outer denticles, up to 10 in number. They are hamate and unicuspidate. From the twentieth tooth outwards the cusp shortens. The 10 marginal teeth (m) are concave with dentate edges.

The holotype, an intact slug, was sent to Dr. HUMMELINCK, Utrecht; the radula of a paratype and the rest of the material are kept in the Department of Zoology, Faculty of Philosophy, University of S. Paulo.

We follow ODHNER (1957) in using the generic name *Chromodoris* for a species with hamate teeth.

By means of PRUVOT-FOL's catalogue of the genus *Glossodoris* (1951a), it is easy to compare any material with the species described above. The pattern of *Ch. binza* is similar to, not identical with, that of *G. fontandraui* PRUVOT-FOL (1951b, p. 24; 1954, p. 262) from Banyuls-sur-Mer. This species, however, has bicuspid teeth, and hence belongs to the *valenciennesi* or *Hypselodoris*-type. The West Indian species of the Chromodorididae, and those from the American Pacific coast, the Atlantic Ocean and the Mediterranean Sea, were all compared with *Ch. binza*.

## 28. *Doris bovena* Marcus, 1955

MARCUS 1955, p. 131.

ARUBA: Malmok, Arasji, 14.VIII.1955 (H 1301), 1 slug.

CURAÇAO: Port Marie Baai, 17.IV.1930 (H 1027), 1 small spec.; Piscadera Baai, under stones, IV.-VI.1962 (C), 9 slugs.

Further distribution: Brazil, coast of S. Paulo, island of S. Sebastião.

The biggest animals were 17 mm long and 8 mm broad alive. They were found in the mangrove region of Piscadera Baai on 18. VI. These three large specimens were darker orange than the smaller ones caught earlier, which were yellow with darker rhinophores and dorso-median area. As in the Brazilian material, there are about 10 rhinophoral perfoliations and 12 unipinnate gills. The radula consists of 30 complete rows and 5 in development; the half-row contains 38 teeth.

An egg-ribbon was hanging out of the nidamental opening in the slug from Aruba, which was 10 mm long in preservation.

29. ***Peltodoris hummelincki***, spec. nov. Figs. 32–35

ARUBA: Malmok, Arasji, 14.VIII.1955 (H 1301), 2 spec.

CURAÇAO: Santa Marta Baai, creek, J. S. Zaneveld leg., 7.XI.1954 (H 1320), 1 spec.; id., 3.III.1955 (H 1320), 4 slugs; Piscadera Baai, outer part, under a stone, 16.IV.1962 (C), 1 slug; Rifwater, J. Boeke leg., 26.VII.1905 (H), 1 slug.

The biggest specimen, from Sta. Marta Baai, is 50 mm long, 30 mm broad, and 15 mm high in preserved condition. Alive, the animal from Piscadera Baai (Fig. 32) was greyish-pinkish with deep-lying clusters of brown chromatophores under white, blunt papillae stiffened by spicules (Fig. 35). In one specimen from Sta. Marta Baai, the papillae of the preserved slug were bulbous. In the 4 slugs in which the pigmentation is preserved, the larger spots form two not quite regular rows, beginning behind the rhinophores and meeting behind the gills. The rhinophores are brown and contain some yellow pigment. The light hyponotum is marked with scattered small dark spots, and the sole is splashed with round brown spots of different sizes. Autotomy of the notal brim, common in species of *Peltodoris* and *Discodoris*, had occurred in one of the slugs. The borders of the pouches of rhinophores and gills bear small papillae. The 6 branchiae are tripinnate, the 20 perfoliations of the rhinophores are not all complete. The tentacles are smooth, flattened cones. The anterior border of the foot is bilabiate with a notch in the upper lip.

The labial cuticle is smooth. The radula of a 27 mm-long slug (Fig. 33) is 2 mm broad and 2.2 mm long, and has 25 rows with 32

teeth to the half-row. The smallest specimen (12 mm) has 16 rows with 22 teeth. The innermost tooth has a prominent expansion near its base, and is considerably shorter than the others. In micra the measurements of the teeth of the smaller radula are: 1st 45, 2nd 70, 3rd 90, 8th 126, 13th–15th 140, 18th 98, 22nd 70. The 5–4 outermost teeth have long straight cusps with blunt, sometimes knobby, tips.

The voluminous stomach lies free over the anterior genital mass in front of the intestinal gland; the oesophagus is embedded in the genital organs.

The ampulla (Fig. 34, o), which is silky owing to its contents of sperm, lies embedded in the female gland mass (w). The male and female branch separate at the anterior end of the ampulla, the former leads to the greyish-brown prostate (q), the latter to the gland mass. The prostate is bent so that an inner longer and narrower limb is followed by an outer, broader one. The wall of the prostate is folded and glandular; the whole organ is distinctly set off from the next, whitish section, a wide, folded and thin-walled efferent duct (e) which narrows to the muscular, terminal part of the male duct. The male duct runs winding to the right and enters the large bulbous penial papilla (pi). This unarmed copulatory organ is enclosed in a thin-walled sac, the penial sheath, a diverticulum of the common atrium (a). The latter extends forward with a short caecum whose wall is thrown into longitudinal folds.

Near the entrance of the inner oviduct the female gland mass exhibits a light-yellow area, the albumen gland, set off from the greyish mucus gland, the principal component of the gland mass. Further structures of the latter, a winding part and a lamellate one, were not analyzed. The gland mass opens with a broad posterior oviduct or nidamental duct (x), whose aperture (f) lies close behind that of the atrium (g).

Immediately behind the orifice of the penial sheath, the vagina (vi) emerges from the common atrium. It begins wide, narrows rapidly, and runs over the winding section of the gland mass, entering the spermatheca (b) from below. The spermatheca is a big, bean-shaped organ. Beside the entrance of the vagina, the uterine or insemination duct (u) leaves the spermatheca. Hence the reservoirs of the spermatozoa (seminal vesicles of BERGH) are arranged serially.

In the coiled uterine duct a spherical spermatocyst (ci) is inserted with a short duct. The silky aspect of the spermatocyst is produced by the parallel-disposed sperms in its lumen. The insemination duct enters the gland mass near the inner oviduct.

The species is named for Dr. PIETER WAGENAAR HUMMELINCK, Utrecht.

The holotype is a preserved, 48 mm-long, intact slug from Sta. Marta Baai. It was returned to Dr. HUMMELINCK, together with paratypes and the slide of the radula of the 27 mm-long slug. One paratype from Piscadera Baai and its radula are kept in the Department of Zoology, Faculty of Philosophy, University of S. Paulo.

The species of *Peltodoris* differ from *P. hummelincki*:

- 1) *P. crucis* (MÖRCH 1863, p. 33; BERGH 1880a, p. 42) from the Virgin Islands is dark grass-green with numerous, uniformly large blackish spots on the notum and a light reddish-brown sole with darker spots. Though it is up to 80 mm long in live condition, and up to 70 mm long when preserved, and has the same number of radular rows (22–28) as *P. hummelincki*, the number of teeth in the half-row (49–50) give the radula a quite different character.
- 2) *P. atromaculata* BERGH, 1880a (p. 45; 1881b, p. 224) from the Mediterranean Sea (PRUVOT-FOL 1954, p. 243; HAEFELFINGER 1961) is white with dark brown or black, round blotches of different sizes. The radula has 20 rows, with 56 teeth per half-row.
- 3) *P. mauritiana* BERGH, 1889b (p. 815; ELIOT 1910b, p. 420), from the western Indic, has up to 40 radular rows and 35 teeth in the half-row. Clubs of rhinophores with at least 40 leaves.
- 4) *P. angulata* ELIOT, 1903 (p. 365), from East Africa, has 38 radular rows and 45 teeth per half-row.
- 5) *P. aurea* ELIOT, 1903 (p. 366), from East Africa, cannot be separated from *P. hummelincki* by the radula (20 rows, 25 teeth), but by its warty, not minutely granulated notum and 8 tripinnate gills.
- 6) *P. rubescens* BERGH, 1905 (p. 134), Kabaena island, S. of Celebes. Notum alive greyish-red, hence similar to *hummelincki*, but the darker specks are small, and no median row of white dots is recorded for *hummelincki*. In preservation the tentacles are small knobs. The immature slug had 24 radular rows and 35 teeth in the half-row.
- 7) *P. greeleyi* MACFARLAND, 1909 (p. 84; MARCUS 1955, p. 157), from Brazil, coast of Alagoas and S. Paulo, has 12–13 simply pinnate gills, up to 49 radular rows and 60 teeth per half-row.

8) *P. noumeae* RISBEC, 1937 (p. 159; 1953, p. 40; 1956, p. 8). New Caledonia; Vietnam. Rhinophores with 8 leaves; gills partly bipinnate, in part unipinnate. There are 38 radular rows with 30 teeth per half-row.

From its first description, *Peltodoris* has been approximated to *Discodoris* BERGH, 1877b (p. 518); its smooth labial cuticle is a clear-cut difference from the rodlets in *Discodoris*. It is less easy to distinguish *Peltodoris*, with its minutely granular notum, from *Diaulula* BERGH, 1880b (p. 40), with a villous one. In *Peltodoris aurea* the notum is covered with small warts; in *P. greeleyi* it was described by MACFARLAND as "villous, quite velvety to the touch, and quite similar to *Diaulula*". No wonder BABA had to correct (1957, p. 13) his earlier references to *Peltodoris mauritiana* (1935a, p. 346; 1935b, p. 119), a species which has not been figured, as concerning *Diaulula sandiegensis* (Cooper, 1862). Dissection reveals that the stomach is enclosed in the liver in *Diaulula* and is free in *Peltodoris*.

*Anisodoris* BERGH, 1898 (p. 508) differs from *Peltodoris* not only in its more arched dorsum, as PRUVOT-FOL (1951b, p. 10) supposes, but its sculpture is also much coarser. On the other hand a vaginal gland (id., 1954, p. 48) does not belong to the generic characters of *Anisodoris*.

30. ***Discodoris mortenseni*, spec. nov.** Figs. 36–39

CURAÇAO: Piscadera Baai, coming up from *Thalassia*, and under stones in shallow water, on sand, in front of the Carmabi, III., VI.1962 (C), 4 slugs.  
TOBAGO: coral reef, Theodor Mortensen leg., IV.1916; one slug.

The largest living animal from Curaçao was 20 mm long. The notum is stiffened by spicules to such a degree (Fig. 37) that after drying it still measured 19 mm in length and 14 in breadth. The slug from Tobago had also been dry; it measured 11 mm and 7 mm. Dr. CORRÊA indicated the colour alive as pinkish with light-brown spots and white specks on the notum and the dark gills. Tip of rhinophores, hyponotum and foot are white. The body of the preserved slug from Curaçao is flat, the hyponotum 6 mm broad. The notum bears dense, spiculate papillae. The spicules are up to 0.5 mm long and have a smooth surface. The 6 gills are multipinnate; the

rhinophores have 20 leaves. The digitiform tentacles (Fig. 36) are long and slender, measuring 1.4 mm in the biggest specimen. The anterior border of the foot is bilabiate, its upper lip is notched.

The labial armature consists of two triangular areae covered with stratified rodlets up to 70 micra in length. The radula (Fig. 38) is remarkably small for the size of the animal—1.3 mm long and 1.2 mm broad in the biggest slug (alive 20 mm long). This radula has 14 rows with 32 teeth in the half-row, the slug from Tobago has 22 rows with 39 teeth. The innermost tooth is a hook 60 micra long, with an expansion near the base; the following massive hooks increase in size to 0.18 mm near the middle of the half-row, their basal expansions are less pronounced than that of the innermost tooth. The 10–8 outer teeth decrease in size; their expansions diminish and disappear at the end of the row. The last tooth is 60 micra long, and straight. In about one third of the rows the cusps of the outermost teeth are dentate; the penultimate tooth has 1–2 denticles, the last up to 5 denticles. In the slug from Tobago the outermost tooth of nearly all complete rows is denticulate, and the penultimate tooth has up to 3 denticles. BERGH (1884, p. 664) recorded similar denticulations of the outermost tooth in the Mediterranean *D. erubescens*. In *D. mortenseni* this denticulation cannot be attributed to damage, as it occurs in quite new rows.

Of the inner organs the blood gland lying in front and behind over the compact brain, the distal male organ, and the seminal reservoirs could be distinguished. The efferent duct ends with a short papilla (Fig. 39), whose opening is subterminal. The papilla bears a few minute cuticular hooks. The narrow vagina of the slug from Tobago opens into a slender spermatheca, and the insemination duct goes out from its end, so that the ducts represent ODHNER's semiserial type (1926, p. 51).

The species is named in memory of our great friend, Dr. OLE THEODOR JENSEN MORTENSEN.

The holotype, a slug 16 mm long, was sent to Dr. HUMMELINCK, Utrecht. The radula of a paratype is kept in the Department of Zoology, Faculty of Philosophy, University of S. Paulo.

We shall compare the species from the Atlantic warm waters with *D. mortenseni*, mentioning only one or two disjunctive characters,

and shall not discuss whether the allocation of every species to *Discodoris* is definitive or not. – 1) *alba* White, 1952. Colour alive white, in preservation cream; no spicules. – 2) *branneri* MacFarland, 1909. Has 5–6 larger black spots on either side of notum. Rows of radula 26; half-row 45–48 teeth. Penial hooks high and numerous. Male papilla with terminal opening. – 3) *edwardsi* Vayssière, 1902. Smooth; tentacles evidently short and broad. – 4) *evelinae* Marcus, 1955. Tentacles short; labial rodlets 40 micra long. – 5) *hedgpethi* Marcus, 1960b. Tentacles short; cusp of innermost tooth with broad denticle. – 6) *indecora* Bergh, 1881a. Tentacles shorter than in *mortenseni* and with submedian groove. – 7) *muta* Bergh, 1877b. Not very different from *mortenseni*, but base of innermost tooth split, and outer teeth not denticulate. – 8) *notha* Bergh, 1877b. Outer teeth of radula slender, without denticles; copulatory organ half as long as efferent duct. – 9) *pusae* Marcus, 1955. Outer teeth of radula lamellar, resembling *Geitodoris*. – 10) *tristis* Bergh, 1899. Tentacles with outer groove. – 11) *voniheringi* MacFarland, 1909. Gills bipinnate; labial armature in one median and two lateral areas; 26 radular rows with 46–50 teeth to the half-row.

### 31. *Aphelodoris antillensis* Bergh, 1879 Figs. 40–42

BERGH 1879b, p. 108; BERGH 1880b, pl. 16 fig. 12–18.

CURAÇAO: Piscadera Baai, outer part, under a stone, 1.2 m deep, 13.VI.1962 (C), 1 spec.

Further distribution: Virgin Islands, St. Thomas.

The living animal (Fig. 40) was 15 mm long and about 3.6 mm broad. It curved its flat body upwards and downwards, lifting the middle or fore and hind ends. The notum is smooth; it covers the head and the root of the tail, and stands out on both sides as a narrow, undulate brim. The rather well preserved colours are: an orange line around the notum, traversed by short radial black stripes which continue on to the hyponotum, and opaque white zones between these stripes. The latter are confluent with a broader dark band parallel to the sides and the anterior border and connected in front of and behind the gills. In front of the latter and behind the



rhinophores the band is joined with central, longish, black blotches. Besides these blotches two small dark spots between them, and some projections of the lateral bands, interrupt the light centre of the notum.

The rhinophores have about 10 dark-brown-spotted leaves; the rhinophoral sheaths are light. The buccal mass was everted when the slug was fixed, and so the tentacles were separated artificially (Fig. 41). They are truncate and bear a longitudinal groove on their outer side. The whole ventral surface is spotted with black, with the exception of the creeping sole, which is whitish. Black and white dots occur on the five tripinnate gills and on the back of the tail.

The lips are coated with a thick, colourless, smooth cuticle. The radula (Fig. 42) contains about 30 rows with 52 teeth to the half-row. All teeth are simple hooks; those in the middle of the half-row are largest. The inner denticle on the innermost lateral tooth indicated by BERGH (1879b, p. 111; 1880b, pl. 16 fig. 13 a) does not occur in the present radula. However, we do not consider this absence as of systematic value, because we know the variability of such denticles from *Discodoris pusae* MARCUS (1955, p. 148).

The slug was dry because the jar had broken, and therefore the inner organs could not be examined.

The colour of the original specimens, kept preserved for twenty years, was yellowish white with some large scattered dark spots.

### 32. *Polycerella conyna* Marcus, 1957

MARCUS 1957a, p. 429; MARCUS 1960a, p. 159.

VENEZUELA, mainland: Guanta, near Barcelona, 15.VIII.1936 (H 1202), 7 slugs among clusters of *Amathia* on wooden piling.

Further distribution: Brazil, coast of S. Paulo, Ubatuba; Florida, area of Miami, Virginia Key and Biscayne Bay.

The three localities now known, far distant from one another, allow of a certain generalization with regard to the habitat of the species; it lives below low water-line, where action of waves is weak, and occurs together with tufts of branching, soft Bryozoa and the

ctenophore *Vallicula multiformis* Rankin, 1956. As food, the ctenostomatous bryozoan *Amathia distans* Bsk. has been observed. A heavy fall of sediments, though of different characters (MARCUS 1960a, p. 192), occurs at the localities in Florida and Brazil.

33. **Polycera herthae**, spec. nov. Figs. 43–46

CURAÇAO: Piscadera Baai, coming up from *Thalassia*, II.–III.1962 (C), 4 spec.

ANTIGUA: Deep Bay, 17.VII.1955 (H 1393), 1 slug.

The living slugs from Curaçao (Fig. 44) were about 3 mm long; evidently they were not full-grown. The length of the preserved animal from Antigua was 2.5 mm. The colour of the living slugs from Curaçao was dirty brown with black and white dots.

The preserved specimens (Fig. 43) have maintained scattered melanophores on back and sides, while the white dots, probably glands, have disappeared. The ground colour is now a greenish grey, with a white border of notum and foot.

The rhinophores have 6 perfoliations. The oral veil has 9–10 short digitations. There are 3 big, tripinnate gills on the anterior part of the branchial circle, and 2 small not completely developed ones on its hind part. The tuberculate notal borders, which begin with the veil, extend around the rhinophores and unite behind the gills. They bear three or four larger knobs each, which are supported by spicules. In a dry specimen from Curaçao these spicules, whose axis is perpendicular to that of the knob, pierce the skin. In the mid-line there are two prebranchial bosses, and in the sketch of the living animal a number of scattered small papillae on back and sides.

The jaws (Fig. 45) have typical wing-like processes. The radula (Fig. 46) consists of 9–10 rows with 2 lateral and 3 marginal teeth to the half-row. The first lateral is very small, it has a spur below the cusp and a broad base drawn out into an inner and an outer point. The second lateral is twice as big as the first. It has a strong cusp and a spur near its base. The three marginal plates decrease in size, the third is quite narrow and even sometimes missing.

The species is named for Miss HERTHA CAPRILES, Secretary and Librarian of the Caribbean Marine Biological Institute, Curaçao, and most kind hostess of Dr. DIVA DINIZ CORRÊA during her stay in Willemstad.

The holotype, a 2.5 mm-long preserved, intact slug from Antigua, was returned to Dr. HUMMELINCK; jaws and radula of a slug from Curaçao are kept in the Department of Zoology, University of S. Paulo.

The species would belong to the now generally abandoned genus *Greilada* Bergh, 1874, maintained by BABA (1960, p. 75). In comparing a specimen 3 mm long with the more than ten times as large *P. elegans* (BERGH, 1894) (EDMUNDS 1961, p. 316: up to 4.25 cm), possibly juvenile characters must be excluded from the taxonomic discussion. The number of rhinophoral leaves and of gills, as well as unipinnate or tripinnate structure of the latter, may depend on the age. But the colour of the living animals and palpable details of the radula must be considered as specific. In *P. elegans*, *messinensis* ODHNER (1941, p. 7) and *atlantica* PRUVOT-FOL (1955, p. 356–59), recently united by EDMUNDS (1961), the colour is yellow or orange with blue spots and a blue mantle border, also in a small slug (PRUVOT-FOL 1951b, pl. 3 fig. 3–4; 1955, p. 356). In *P. aurisula* the young, 3 mm-long slugs (MARCUS 1957a, p. 432) have even more brilliant colours than the larger ones (id. 1958b, p. 52). In *P. elegans* the inner lateral tooth has no dilated and pointed base, and the second tooth is also less elaborate than in the present species.

#### 34. *Dendrodoris krebsii* (Mörch, 1863)

MÖRCH 1863, p. 34 (*Rhacodoris Krebsii*); BERGH 1875c, p. 87 (*Doriopsis Krebsii*); BERGH 1879c, p. 44 (*D. Krebsii* var. *pallida*), p. 49 (*D. atropos*); MARCUS 1957a, p. 443 (*Dendrodoris atropos*).

CURAÇAO: Piscadera Baai, under a stone in muddy water of the mangrove region, 18.VI.1962 (C), 1 spec.; Spaanse Water, under a sheet of eternit in shallow water near the mangrove region, on clear coralline, sandy bottom with algae, 22.II. and 3.VI.1962 (C), 7 slugs.

ST. KITTS: Frigate Bay, 20.VII.1955 (H 1397), 1 spec.

Further distribution: Virgin Islands, St. Thomas and St. Croix; Brazil, coast of Rio de Janeiro and S. Paulo, from Cabo Frio to Cananéia.

The largest specimen, that from Piscadera Baai, was 70 mm long and 40 mm broad alive. The following colours were observed in the living slugs in Curaçao: dark brick-red notum peppered with yellow and with black spots, yellow border with irregular streaks of the colour of the back, yellow underside with some orange blotches. The

rhinophores are darker than the back and have white tips. The gills are stippled brick-red and yellow. Some animals were uniformly brown or light brown with dark, nearly black spots on dorsal and ventral sides.

There are more than 20 rhinophoral leaves and 6 tripinnate gills. The central nervous system of the slug from St. Kitts is as concentrated as in our *D. atropos* (1957a, fig. 148). The length of the hook-bearing portion of the penial papilla varies from 1.4 mm (Curaçao) to 2.5 mm (St. Kitts); the shape of the hooks is different, the outer ones are strong and straight, those in the middle thin and straight, and the innermost ones more curved. The arrangement of the hooks differs in the material from St. Kitts and from Curaçao; in the former there are 20 rows in front and about 10 behind, in the latter a serial disposition occurs only in front, the inner hooks forming irregular quincunxes.

The colour of living *D. krebsii* is not described by MÖRCH or by BERGH. Dr. CORRÊA's notes are conformable with the wide range of variation that we know in respect of living *D. atropos*, which is common on the coast of S. Paulo. The details of the arrangement of the penial hooks are inconstant. BERGH (1875c, p. 88) mentioned spicules in the connective tissue of *krebsii*, especially numerous in the rhinophores. In his description of *atropos* (1879c, p. 49 ff.) neither presence nor absence of spicules is indicated. The rhinophores of *D. krebsii* var. *pallida* have no spicules and those in the skin are scarce (BERGH 1879c, p. 46). Some spicules occur in the rhinophores of the new material from Curaçao, and slight vestiges in the seven-years-old alcohol material from St. Kitts and also in our formalin-preserved specimens of *atropos*. The high concentration of the central nervous system is the same in the Caribbean and Brazilian slugs. We therefore consider it impossible to maintain the slugs from both regions as separate species.

35. *Scyllaea pelagica* Linné, 1758 Figs. 65–66

BERGH 1875b, p. 319; BERGH 1884, p. 33; BERGH 1892, p. 9; VAYSSIÈRE 1901, p. 92; VAYSSIÈRE 1913, p. 258; ODHNER 1936, p. 1096; BABA 1949, p. 89, 168; PRUVOT-FOL 1954, p. 367.

BONAIRE: Lagoen, 23.X.1930 (H 1070A), 1 spec. (Fig. 65).

Further distribution: Circumtropical and circumsubtropical, including the E Pacific and the eastern Mediterranean Sea, on floating fucoids, feeding upon hydroids. Sometimes transported to temperate regions by currents (MARCUS 1961b, p. 148).

Though *Scyllaea pelagica* was not present in the material received, HUMMELINCK's observations on the living slug document the occurrence of the species on the E coast of Bonaire. With the range given above, we do not mean that *S. pelagica* is the only species of the genus, as PRUVOT-FOL (1934, p. 58) assumes. The other species mentioned in ODHNER's key are evidently valid too, but they were not reported from the Atlantic Ocean.

"The animal was drifting on the surface of the water with the flood tide, towards that corner of the Lagoen (a landlocked bay) which was farthest from the sea. With the sole upwards, it made swimming motions by contracting longitudinal muscles on the left and right sides alternately. In the course of this, the head was brought to the tail about twice a second, without the slug being able to steer itself in a particular direction. – The animal creeps slowly, making searching movements with its head, in doing this part of the sole is detached from the substratum and contracted. When the foot is not in action, the margins are contracted in transverse direction. In the act of creeping, the length of the foot is about 4.2 cm, the total length being 5 cm. – The ground colour is a patchy yellowish-green or brownish. The margins of the foot are irregularly speckled with brown spots; the margins of the parapodia are distinctly brown-stained here and there; brown patches are visible along the upper edges of the rhinophores; there is a small brown spot in the middle of the head. – There is a tendency towards formation of a mediolateral white stripe: on the left side, three elongated white patches each with a white papilla, and behind them two patches without papillae; on the right side, two elongated white patches with papillae. In addition, small white patches also occur dorsolaterally, where they tend to form vaguely defined white streaks, without papillae, on the parapodia. The white parts are always surrounded by zones without brown pigment, except for some small white patches near the tail. – Blue spots are found on the flanks: on the left side, three large spots and one smaller spot; on the right side, three, the foremost of which is not translucent – and dorsally: one between the rhinophores, one mediodorsally, and two which are more posteriorly situated. Small jet-black fragments of pigment, simply lying in the brown-pigmented ground, on the sides of the head, are regarded as eyes." (PWH) (Cf. Figs. 65–66.)

### 36. *Hancockia ryrca* Marcus, 1957

MARCUS 1957a, p. 451; id. 1958b, p. 56.

CURAÇAO: Piscadera Baai, from algae growing on the pillars of the pier of the Carmabi, IV.1962 (C), 3 slugs.

Further distribution: Brazil, coast of S. Paulo, 14 km W of Ubatuba, from *Padina*, near low water-line.

The slugs were young, 1.5–3.5 mm long in preservation. Alive, the colour was pink. They had 3–4 flaps on each half of the velum, hence

much less than in adult specimens. On the other hand, the number of cerata, 5 on the left, 4 on the right side, is the same. The radula has 43 rows (in the holotype: 46). On the rhachidian tooth the median denticle may be smaller than the innermost of the 5 lateral ones.

37. **Doto cinerea** Trinchese, 1881

TRINCHESE 1881a, p. 92; VAYSSIÈRE 1888, p. 102; VAYSSIÈRE 1929; PRUVOT-FOL 1951b, p. 49; 1954, p. 406 (*rosea*); WIRZ-MANGOLD & WYSS 1958, p. 62 (*rosea*).

ANTIGUA: Deep Bay, 17.VII.1955 (H 1393), 1 spec.

Further distribution: Western Mediterranean Sea; Cape Verde Islands (ELIOT 1906, p. 153).

The single slug, 2 mm long in preservation, had only one ceras left; the others had fallen off in life, as there were no scars. Hence the certainty of the determination is somewhat restricted, but can be accepted on the basis of the shape of the ceras, the rhinophoral sheaths, and the rather large basal black spot on the inner side of the ceras.

According to PRUVOT-FOL (1954, p. 406, note 1) *D. rosea* Trinchese, described higher up on the same page as *D. cinerea*, is identical with the latter. But as the anatomy of neither is known, caution prompts maintenance of the two names, as VAYSSIÈRE (1913, p. 309, 310) and ODHNER (1936, p. 1120) did.

38. **Doto pita** Marcus, 1955

MARCUS 1955, p. 169; 1957a, p. 455; 1960a, p. 164.

SAINT CHRISTOPHER (St. Kitts): Frigate Bay, 20.VII.1955 (H 1397), 1 slug.

Further distribution: Florida, Miami area, Virginia Key; Brazil, coast of S. Paulo.

The single small slug was recognized by its characteristic irregular pointed tubercles on the cerata.

39. **Doto divae** Marcus, 1960

Fig. 67

MARCUS 1960a, p. 165.

BONAIRE: Kralendijk, near Pasanggrahan, 15.IX.1930 (H 1957a), 1 spec.

ANTIGUA: Deep Bay, 17.VII.1955 (H 1393), 1 slug.

ST. KITTS: Frigate Bay, 20.VII.1955 (H 1397), 1 spec.

Further distribution: Florida, Miami area, E coast of Virginia Key.

"Bonaire specimen found creeping near the surface of the water. – Total length: 6 mm max.; breadth of foot  $\frac{1}{2}$  mm; height about  $1\frac{1}{2}$  mm; longest rhinophore  $1\frac{1}{2}$  mm. – Light-brownish in colour; the cerata somewhat cream-coloured (in slightly narcotized condition)." (PWH)

The black pigment in the end of the round tubercles makes this species easily recognizable.

40. **Doto chica** Marcus, 1960

MARCUS 1960a, p. 167.

CURAÇAO: Piscadera Baai, in growth on root of mangrove, 28.II.1962 (C), 1 slug.

Further distribution: Florida, Miami area, Virginia Key, among algae.

The animal was 8 mm long alive, whitish, but rather dark owing to numerous melanophores. On the right side 9, on the left side 8 cerata, each with 3 rows of tubercles and a prominent light tip. In Dr. CORRÊA's sketch of the living slug the veil is more expanded than in our drawing of the preserved specimen (1960a, fig. 50).

41. **Doto doerga**, spec. nov. Figs. 47–51

ATLANTIC OCEAN: Lat. 35°N, Long. 63°W, temp. 19°C, on *Sargassum*, together with the turbellarian *Vorticeros* spec., 4.XII.1930 (H), 3 slugs.

The slugs were uniformly brown, as preserved animals often are after many years in alcohol, and no black pigment was recognizable. The length was about 2 mm. The 4 to 5 pairs of cerata attain a height of more than 1 mm and bear up to 15–16 tubercles, one at the tip and the others mostly on the outer surface (Fig. 48) in about 4 transverse rows. In the upper half of the inner surface (Fig. 50) of the cerata there are sometimes 1 or 2 tubercles. The ceras lies apposed to the convex back with its concave inner side (Fig. 49), and the opening through which the diverticulum of the digestive gland, the vessels, and the nerve enter the ceras is situated near the middle of the inner surface. Special gills are not developed, as was proved by microtomic sections.

The clubs of the rhinophores are withdrawn, the margins of the sheath are lobate, not even (Fig. 47). The radula (Fig. 51) consists of 52 teeth, 5 of which are new and in development, and 5 old, worn ones cast off. The median cusp is thin; the position of the lateral denticles shifts in such a way that they occupy the same place in every second row. The lateral denticles are asymmetrical; on one side there are 3-4 round and on the other 2-3 flat ones.

The holotype, a slug 2 mm long, a slide with the radula, and a paratype were returned to Dr. HUMMELINCK.

The previously mentioned *Doto chica* differs only in details from the new species. It has a smooth margin of the rhinophoral sheath, a few tubercles and sometimes a small gill on the inner side of the cerata, and the strongest denticle lies at the same level on every fourth tooth in the radula.

*D. obscura* ELIOT (1906, p. 152), from the Cape Verde Islands, had been washed from seaweeds. Its tubercles on the inner side of the cerata are imperfectly developed. But there are 7 pairs of cerata, the margin of the rhinophoral sheath is produced into a lip, and the 2-3 denticles flanking the median cusp are not very distinct.

*Doto* (?) *ocellifera* SIMROTH (1895, p. 168) is no *Doto* (ODHNER 1934, p. 301), but possibly belongs to the ascoglossan genus *Costasiella* (MARCUS 1960a, p. 151).

*Doto floridicola* SIMROTH (1888, p. 219), from red algae at the Azores and in the Mediterranean Sea (PRUVOT-FOL 1951b, p. 49), bears a branchial knob on the inner side of all its 4-5 pairs of cerata.

*Doto pygmaea* BERGH (1872b, p. 1277-1280, pl. 11 fig. 1-10) requires a detailed comparison with *doerga*, because it too has been found in the Sargasso Sea. It has 4 simple lateral teeth on either side of the central radular tooth. According to BERGH's figures 8 and 9 these tiny, spine-like teeth appear only in the 3 or 4 newest rows and are lost later on. They are the basis for BERGH's genus *Dotilla* (1879a, p. 574), whose name was changed to *Iduliella* by THIELE (1931, p. 449). We do not attribute systematic significance to the absence of these lateral teeth in *doerga*, because high variability is normally associated with decreasing functional importance of a structure. BERGH (1892, p. 1047) and ODHNER (1936, p. 1118) thought that *pygmaea* might be identical with *floridicola*, but the



latter has distinct tubercles over the whole inner side of the cerata. In *pygmaea* such occur only in the upper half of the inner side, while the basal half is concave. So *pygmaea* and *doerga* agree in this character, but clear differences between both are smooth (*pygmaea*) and lobate (*doerga*) margins of the rhinophoral sheaths; 25–30 (*pygmaea*) and 15–16 (*doerga*) tubercles per ceras, in longitudinal (*pygmaea*) and transverse rows (*doerga*) on the outer side of the cerata; inconspicuous (*pygmaea*) and strong (*doerga*) lateral denticles beside the median cusp of the radular tooth.

42. **Coryphella dushia**, spec. nov. Figs. 52–54

CURAÇAO: Piscadera Baai, from *Thalassia* in the mangrove region, end of II. – beginning of III. 1962 (C), 3 slugs.

Length of living animals 5 mm; body slender, with long, filiform caudal region (Fig. 52). Rhinophores and tentacles smooth, the former slightly longer than the latter; angles of foot produced, but shorter than tentacles. White, without lines or other marks; the diverticula of the digestive gland from orange to brown. Tips of cerata transparent, the cnidosacs opaque white. Cerata in 5 groups, the foremost consisting of 3 rows. Anus beneath interhepatic space.

Masticatory border of jaw (Fig. 53) with several rows of short, pointed denticles. These give the process a brush-like appearance. Radula (Fig. 54) with 23 rows. Rhachidian tooth with strong median cusp and 6 smaller though also strong denticles on either side. Lateral teeth high, slender, with incised base and 12 minute denticles on the inner edge.

The holotype, an intact slug, was sent to Dr. HUMMELINCK; the radula of a paratype is kept in the Department of Zoology, Faculty of Philosophy, University of S. Paulo.

The slugs are rather small, but the number of radular rows seems to indicate (see LÖYNING 1922, p. 22) that they are adult.

As *C. dushia* is the first tropical Atlantic species of *Coryphella*, we had to compare it with the representatives of the genus in the Mediterranean Sea and the tropical warm temperate waters of the Indo-Pacific Ocean.

*C. pedata* (Montagu, 1815), described by ODHNER (1939, p. 61)

and PRUVOT-FOL (1954, p. 421), is of all known species the most similar to *C. dushia*, but its skin is violet in colour and it has 5–7 strong denticles on the lateral teeth. Tiny lateral denticles occur in *C. borealis* ODHNER (1922, p. 31; 1939, fig. 19), but the central tooth of *borealis* differs widely from that of *dushia*.

Among the species of the Indo-Pacific Ocean, *C. ocellata* (ALDER & HANCOCK 1864, p. 144) approaches *C. dushia* in the arrangement of the cerata in separate tufts, but the colour of *ocellata* and the brown rings on the lower third of its cerata are distinguishing features. In *C. californica* BERGH (1904, p. 6) from the Gulf of California, hence the geographically nearest species, the front angles of the foot are longer than tentacles and rhinophores, and the median tooth has 13–21 denticles on each side of the central cusp. No special discussion of their differences from *C. dushia* is required in the case of the further Pacific warm-water species of *Coryphella*, the little known *C. semidecora* (PEASE 1860, p. 34); *C. parvula* (PEASE 1860, p. 35), figured by BERGH (1881a, pl. G fig. 17); *C. foulisi* (ANGAS 1864, p. 64) and *C. ornata* RISBEC (1928, p. 266; 1953, p. 143; BABA 1936, p. 44). From the temperate North Pacific but, as inhabitant of floating fucoids, possibly of wider range, we mention *C. athadona* BERGH (1875a, pl. 11 fig. 12–13; 1876, p. 635), whose foot is rounded in front, without produced angles.

The last character is exceptional in *Coryphella*, while rhinophoral sculptures are known for the above-cited *C. ornata* and for *C. nobilis* Verrill, 1882. The former was described with club-shaped, finely perfoliated rhinophores, the latter, which LEMCHE (1941, p. 28) maintains in *Coryphella*, has warty rhinophores (ODHNER 1922, fig. 3). In *C. scacchiana* (Philippi, 1844) the circular folds of the “trinde, langstrakte” cephalic appendages (BERGH 1864, p. 100) are difficult to understand; PRUVOT-FOL (1954, fig. 165 h) draws rhinophores whose folds seem to be brought about by muscular contraction.

#### 43. *Fiona pinnata* (Eschscholtz, 1831)

ALDER & HANCOCK 1855, p. 52–53, fam. 3, pl. 38A; BERGH 1874, p. 605; BERGH 1892, p. 6; MARCUS 1961a, p. 50.

ARUBA: Boca Prins, on *Sargassum* cast ashore, 28.VI. and 3.VII.1930 (H 1011), 5 slugs.

Further distribution: Pelagic and gregarious in warm and temperate seas, feeding on Chondrochorae (*Verella*, *Porpita*) and Lepadidae; also found on *Sargassum*, *Macrocystis*, and other floating substrata.

The best character by which to recognize this species is the branchial fold on the large cerata of about four of the inner rows (PRUVOT-FOL 1954, fig. 172 d).

44. ***Catriona tina* Marcus, 1957** Fig. 68

MARCUS 1957a, p. 459; 1960a, p. 177; 1961b, p. 148.

BONAIRE: Kralendijk, near Pasanggrahan, 14.IX.1930 (H 1057a), 3 specimens (Fig. 68).

St. KITTS: Frigate Bay, 20.VII.1955 (H 1397), 1 slug.

Further distribution: Florida, Miami; North Carolina, Beaufort; Brazil, coast of S. Paulo.

"Bonaire specimen (narcotized with magnesium sulphate) more or less transparent and rather colourless; irregular pattern of patchy, diffusedly shining cloudy white, leaving the greater part of the flanks uncovered; dirty brown translucent portions at the bases of cerata, rhinophores and tentacles. - Length of the animal creeping, about  $2\frac{1}{2}$  mm; breadth of the sole  $\frac{1}{4}$  mm." (PWH)

The species can be identified by the single row of cerata in each of the anterior livers.

45. ***Catriona maua* Marcus, 1960** Figs. 55-56

MARCUS 1960a, p. 177.

CURAÇAO: Piscadera Baai, coming up from *Thalassia*, and living among growth on stones with hydroids and sponges; from the hydroids, the slugs had to be picked off; III.1962 (C), 14 animals.

BONAIRE, Kralendijk, near Pasanggrahan, 3.IX.1930 (H 1057), 1 slug which was used up for classification.

Further distribution: Florida, Miami area, Virginia Key, among Hydrozoa.

The living slugs were transparent white with opaque white dots and brownish diverticula of the digestive gland in the cerata. The latter are sometimes pinkish with white transverse stripes, and vary much in size and shape. The black eyes lie at the root of the rhinophores, which may have a brown line on their inner side. Dr.

CORRÊA's sketch of the living animal corresponds rather well with our figure of the preserved slug (MARCUS 1960a, fig. 74), except for the tail, which is very long and thin in several, not all, of her specimens. The best character of the species is the radula previously described (1960a, p. 179). We take the opportunity to figure the preradula (Fig. 56). The first tooth is five times as long as broad, similar to *Miessa evelinae* (MARCUS 1957a, fig. 210-211; name of the genus: id. 1961b, p. 148); the following teeth decrease in length, and only the 4th or 5th assumes the definitive shape. From then on the size increases gradually to a breadth of 40  $\mu$  (Fig. 55).

46. **Learchis poica** Marcus, 1960

MARCUS 1960a, p. 183.

CURAÇAO: Piscadera Baai, from hydroids and algae on the pillars of the pier of the Carmabi, and other places in shallow water, III.-IV. and VI.1962 (C), 3 spec.

Further distribution: Florida, Miami area, Virginia Key.

The living slugs were white in front, brownish behind, or brownish all over with white blotches and white midline. Cerata numerous, black with white tips and scattered white spots. Anterior livers as in the original specimens (1960a, f. 82); post-anal arches incomplete. Base of tentacles light brown, upper half with white. About 10 irregular perfoliations on rhinophores. Jaw with denticulate border. The prominent cusp of the radular tooth flanked by 5-8 denticles; the older teeth with more numerous denticles than the bigger newer ones.

47. **Moridilla kristenseni**, spec. nov. Figs. 57-60

CURAÇAO: Piscadera Baai, from *Thalassia* and algae grown on the panels hanging from the pier of the Carmabi, II. and VI.1962 (C), 2 slugs.

The 5-6 mm long, slender slugs are light yellow with a silvery-white net and black stipples on the pointed cerata (Fig. 57). Anterior livers with 6 rows of cerata, posterior liver with 5 groups on each side, leaving a short tail free (Fig. 58). Tentacles thick,

rhinophores with smooth anterior face and several series of blunt pegs on the posterior side. Foot corners produced, about as long as tentacles. Masticatory border (Fig. 59) with irregular knobs. Radula (Fig. 60) consisting of 16 teeth, the central cusp flanked by 4–6 denticles. The innermost denticles as prominent as the cusp and only slightly thinner, the outer ones finer.

The species is named for Dr. INGVAR KRISTENSEN, Director of the Caribbean Marine Biological Institute, Curaçao.

The holotype, an intact slug, was sent to Dr. HUMMELINCK; the radula of the paratype is kept in the Department of Zoology, Faculty of Philosophy, University of S. Paulo.

The species differs in jaw and radula from the much bigger, in preservation 24 mm long, single specimen of *M. brockii* BERGH (1889a, p. 681; 1890, p. 878) from Edam Island off Batavia. The masticatory process of the latter bears a single row of about 10 coarse denticles, and the median cusp of the radular tooth is flanked by only 2 denticles on each side.

As it is a Bermudian species with tuberculated rhinophores, *Facelina angari* SMALLWOOD (1910, p. 141) must be compared with *Moridilla kristenseni*. The tubercles surround the rhinophores on all sides in *angari*, and further tubercles occur in rows between the bases of tentacle and rhinophore of each side, between the two rhinophores, and along their sides. The tentacles are slender, longer than the rhinophores, and have a rough surface. The much greater size of *angari* (30 mm alive) cannot explain these sculptural differences. Jaws and radula of *angari* were not described. *Facelina dubia* PRUVOT-FOL (1948, p. 99; 1954, p. 391) from Arcachon, according to the spiny penial leaf a true *Facelina*, might be identical with *angari*.

#### 48. *Phidiana lynceus* Bergh, 1867

BERGH 1867, p. 104; BERGH 1874, p. 615 (*lynceus*); BERGH 1879a, p. 560 (*Selencae*); ENGEL 1925, p. 67, 79–80 (*brevicauda*); MARCUS 1955, p. 178; 1957a, p. 467 (*selenhai*); 1962b, p. 479 (*lynceus*).

CURAÇAO: Piscadera Baai, in front of the Carmabi, among algae and under a stone, II. and IV.1962 (C), 4 slugs.

BONAIRE: Kralendijk, near Pasanggrahan, 3.IX.–10.X.1930 (H 1057, 1057a, 1057b) and 20.IX.1948 (H 1057C); numerous specimens, from most of them the radula had been removed.

Further distribution: Curaçao, Caracas Baai, C. J. van der Horst leg. 1920 (ENGEL, l.c.); Guadeloupe; Virgin Islands; Brazil, Bahia, Cabo Frio, and from Rio de Janeiro to Cananéia (25°03' S).

Field notes on the Bonaire specimens: "5.IX.1930. Total length alive 25 mm, tail 5 mm long, breadth of foot when creeping 2 mm. Creeps 1 cm in 5 sec. — 14.IX.1930. Total length creeping 10 mm, breadth 3 mm; tentacles  $2\frac{1}{4}$  mm, rhinophores 2 mm, tail 3 mm, longest cerata 2 mm, breadth of foot creeping  $1-1\frac{1}{4}$  mm; distance between tips of rhinophores when seeking, about 7 mm. Creeps 1 cm in 8 sec. — Blue-grey hyaline, basal parts of papillae brown, gradually merging into the white of the appendages. Mediodorsally a white longitudinal stripe, with special markings on head and rhinophores. Upper half of rhinophores white, a narrower central zone light-brown, rest (basal part) colourless. — 15.IX.1930. Length creeping 23 mm. Creeps 1 cm in 5 sec. — 10.X.1930. During creeping, papillae stand erect; when stimulated, they are twitched to one side. — Rhinophores with brown bands; papillae brown-translucent, with white tips. Top of head and cheeks brown with familiar median bluish-white marking." (PWH)

Alive the slugs attain 25 mm in length without the tentacles (material from Piscadera Baai). Living animals are translucent white or have a brown colour on body, tentacles, rhinophores, and sole. In the brown specimens white areas with an inner brown and an outer yellow circle may occur between the groups of cerata. The white animals frequently have a silvery-white stripe on either side below the cerata, and an opaque white mid-line on the tail. In these white slugs the diverticula of the digestive gland within the cerata may be reddish brown; the cnidosacs are white. The tentacles are reddish with lighter tips; the rhinophores are reddish in the middle and light grey above. In front of them two silvery-white stripes run to the tentacles. The area flanked by these stripes, and the sides of the head, are greyish red. The white marks are rarely preserved in fixed material. The contents of the hepatic diverticula may become so dark in preservation as to result in a black ring at the base of the cnidosac.

Normally the tail, i.e. the part behind the cerata, is one fourth of the body length. This also applies to ENGEL's figure 4 of a slug without cerata, if the tail is measured along the sole. In many slugs the caudal region is in regeneration, and then it is shorter. The anus lies between anterior and posterior group of the right-hand left liver (MARCUS 1955, fig. 250 a). These are the 3rd and 4th groups, because the anterior right liver frequently consists of 2 groups. The 3rd and

4th groups are indistinctly separated. In the cited fig. 250 some of the innermost cerata of the last group originate so far in front that they might be considered as elements of the preceding group. On the left side there is not even an indication of separation between an anterior and a posterior group of the posterior left liver. The right interhepatic space, i.e. the area between anterior right liver and right-hand branches of the left liver, is crossed by a longitudinal connecting canal beset with up to 5 glandular cerata (MARCUS 1957a, p. 470).

The anterior disc-shaped dilatation of the foot is the same as in the specimens we have seen before.

The number of denticles on the masticatory process of the jaws reveals itself as not specific. In the present material from Curaçao there are about 15; ENGEL (1925, p. 70) found more than 20, also in specimens from Curaçao; BERGH (1874, p. 617), 14–15 in animals from Guadeloupe; we ourselves (1962b) found 24 in a slug from St. John; and BERGH (1878) and ourselves (1955; 1957a), 20–30 in animals from the coast of Rio and S. Paulo.

The penial stylet is funnel-shaped and opens terminally. At the base of the stylet lies the principal outlet of the male duct (MARCUS 1957a, fig. 218). The tip of the funnel may be almost straight (*lynceus*, Bergh from Guadeloupe), or bent, in the latter case being curved towards the side of the principal opening (*selenkai* Bergh from Rio; *brevicauda* Engel from Curaçao and the present material from Bonaire) or in the opposite direction (*selenkai* Marcus from the littoral zone of S. Paulo).

As ENGEL presumed (1925, p. 35), the 3 species described from the West Atlantic warm-water region must be united. It is possible that *Ph. inca* (d'Orbigny, 1837) is the same species too; it is reported from Perú, Callao, to Chile, Lat. 41°50' S (MARCUS 1959b, p. 79). A single specimen found together with *inca* at Coquimbo (Lat. 30° S) has been separated as *Ph. exigua* BERGH (1898, p. 559), but evidently does not deserve a separate name. A slight difference of the radular teeth, especially their median cusps, exists between *inca* and *exigua*, but it is not sufficiently clear-cut to permit a specific separation.

*Ph. pugnax* LANCE (1962, p. 157) evidently has two groups of

cerata in the right anterior liver. The anus lies within the anterior group of the right-hand left liver, LANCE's "third major group of cerata". The masticatory border of the jaw bears 14 denticles, a small number for this large species. The stylet is also minute in proportion to the penis.

49. ***Glaucus atlanticus* Forster, 1777**

BERGH 1864, p. 105; BERGH 1889a, p. 676. – Syn. *Glaucus marinus* auct.

ARUBA: Boca Prins, on Sargassum, cast ashore, 28.VI. and 3.VII.1930 (H 1011), about 50 specimens.

Further distribution: Circumtropical; the second report (DU PONT 1763, Phil. Trans. 53, p. 57) of the species refers to material from the sea near Jamaica.

ODHNER (1926, p. 25; 1934, p. 278) allocated the Glaucidae to the Eolidacea Cleioprocta, on the basis of the position of their anus behind the interhepatic space (BERGH 1864, p. 119). The latter author has produced an anatomical monograph and excellent figures for these slugs; his study of their discovery led him to the oldest pre-Linnean, and therefore invalid name of the species: *marinus* (Breyne, 1705), which has not been legalized by DU PONT's unnamed picture (1763, pl. 3).

50. ***Dondice occidentalis* (Engel, 1925)**

ENGEL 1925, p. 73; MARCUS 1958a, p. 62; MARCUS 1960a, p. 186; MARCUS 1961b, p. 148.

BONAIRE: Paloe Lechi, 4.IX.1948 (H 1056B); Kralendijk, 20.IX.1948 (H 1057C); Punt Vierkant, 9.IX.1948 (H 1059A).

VENEZUELA mainland; Guanta, near Barcelona, 15.VIII.1936 (H 1202).

ST. MARTIN: Simson Bay Lagoon, outlet, 2.VIII.1949 (H 1131); id., Flamingo Pond, 8.VI.1949 (H 1132). A total of 8 specimens.

Further distribution: Jamaica; Florida, Miami; North Carolina, Beaufort; Brazil, coast of S. Paulo.

The species can often be determined without dissection by the black epithelium covering its mandibles, which shines through the rather transparent skin.



51. **Nanuca sebastiani** Marcus, 1957

MARCUS 1957a, p. 474.

CURAÇAO: Piscadera Baai, from algae in front of the Carmabi, 24.II.1955 (C), 2 slugs.

Further distribution: Brazil, State of Pernambuco, Recife, Praia da Piedade, among calcareous algae from the outer side of the reef, quite near the surface.

Dr. CORRÊA's notes make it possible to complete the first description based upon preserved specimens. The living slugs were 6 mm long, and slender. The ground colour of the body is light brown, with orange spots in white areae. A white mid-line, which begins in the fore end and ends close behind the rhinophores, contains 5-6 orange spots. White areae with up to 6 orange spots occur between the two first and the 2nd and 3rd groups of cerata. The latter area, as well as that over the heart, is more or less cross-shaped. The small area between the 3rd and 4th groups of cerata is circular with one orange spot in the centre. Tentacles and rhinophores are light brown, the former with white spots. The characters of the preserved material agree with those of the first description.

52. **Favorinus branchialis carneus** Fig. 61  
(Alder & Hancock, 1855)

ALDER & HANCOCK 1855, p. 50, Suppl. p. ix; ELIOT 1906, p. 158.

CURAÇAO: Piscadera Baai, coming up from *Thalassia*, end of II. - beginning of III. 1962 (C), 19 slugs.

Further distribution: Cape Verde Islands, Boavista; English Channel coast, Devon.

The slugs were 7 mm long alive, white with dark-brown liver contents in the body, much lighter in the nodular diverticula within the cerata. Basal third of rhinophores dark (Fig. 61). Tentacles and rhinophores of about equal length; anterior angles of foot produced. Cerata form 5 groups. They are long with short cnidosacs. The rhinophores bear a subapical bulb, with a smaller knob close below it. Masticatory process of jaw has several series of denticles; spur of radular tooth smooth, without any vestiges of oblique striae on the sides of its base, even when viewed under high power.

The present slugs do not have rose-red cerata, but the colour of

the liver contents varies according to the food (HAEFELFINGER 1962), and is insignificant for systematic distinctions. The apical dilatations of the rhinophores are less regular than in ELIOT's figure (1906, pl. 14 fig. 13), but nevertheless we think that *F. carneus*, understood as a subspecies of *F. branchialis* (O. F. MÜLLER, 1806), is an adequate name for our specimens. In *F. albus* ALDER & HANCOCK, 1844 (p. 164; id. 1845, Fam. 3 pl. 1) two rhinophoral bulbs may also occur (id. 1855, p. viii), but these, or at least the lower one, belong to the dark part of the rhinophore.

ODHNER (1907, p. 32, 87) and ELIOT (1910a, p. 172) distinguished *F. albus*, with a smooth spur of the radular tooth (MEYER & MOEBIUS 1865, pl. 2 fig. 4), from *F. branchialis* (O. F. MÜLLER, 1806), with strong basal denticles (BERGH 1879a, p. 568). But as vestigial, weak, and distinct denticles occur in *albus* (for references and description see LÖYNING 1922, p. 80, 82, 86), the Northeastern Atlantic and the Mediterranean species are now united (ODHNER 1939, p. 78; PRUVOT-FOL 1954, p. 400) under the oldest name, which was, according to BERGH (1879a, p. 566), established rather arbitrarily.

### 53. *Favorinus auritulus* Marcus, 1955

MARCUS 1955, p. 181.

CURAÇAO: Piscadera Baai, coming up from *Thalassia*, from algae on the pillars of the pier of the Carmabi, and algae growing on the panels hanging from the pier, III.-IV.1962 (C), 12 slugs.

ANTIGUA: Deep Bay, 17.VII.1955 (H 1393), 1 spec.

Further distribution: Brazil, coast of S. Paulo, common in various localities.

The transparent white living slugs had median broad, opaque white areas behind the tentacles, the rhinophores, and farther behind. The area behind the rhinophores had an orange centre, and the diverticula of the digestive gland in the cerata were orange. The milky white tips of the rhinophores and their three bulbs agree with the original material, and also the dark pigment in the epidermis of the rhinophores is present. Though *auritulus* may possibly be defined later as a subspecies of *F. branchialis*, we think that for the moment it is better to maintain *auritulus* for slugs with three bulbs on the rhinophores. The cusp of the radular tooth bears lateral denticles on its base, tiny in our Brazilian material, strong in that from Curaçao.

54. **Lamellaria perspicua perspicua** Linné, 1758

BERGH 1853, p. 90; 1887, p. 227; MARCUS 1959b, p. 13; MARCUS 1960a, p. 169.

CURAÇAO: Piscadera Baai, under a stone 1.5 m deep, 17.IV.1962 (C), 1 ♀.

Further distribution: Florida, Dry Tortugas; Virginia Key in the Miami area. South America: northern Patagonia, Strait of Magellan, and southern Chile. Eastern Atlantic Ocean, including Mediterranean Sea but not the Arctic. Indo-West Pacific Ocean. From the intertidal zone to 1,287 m.

The colour of the living specimen was orange, with lighter bosses and white stipples; the flat shell differs from the similarly coloured *L. cochinnella* PERRY (1940, p. 79) from western Florida. The animal was young, as is shown by its 5 mm-long and 3.3 mm-broad shell. The radula has 45 rows; the cusp of the rhachidian tooth bears 4 right and 4 left denticles; the lateral tooth has 3–5 big denticles on the upper or inner cutting edge and 9–10 finer ones on the lower or outer edge. All measurements tally very well with those of the male from the Miami area (MARCUS 1960a, p. 190).

55. **Lamellaria perspicua mopsicolor** Fig. 62  
du Bois-Reymond Marcus, 1958

DU BOIS-REYMOND MARCUS 1958, p. 11; MARCUS 1959b, p. 14.

CURAÇAO: Piscadera Baai, from *Thalassia*, 5.III.1962 (C), 1 ♀.

Further distribution: Brazil, Cabo Frio (22°57' S; 42°01' W) and coast of S. Paulo; Strait of Magellan; southern Chile, Gulf of Ancud and coast of Chiloé. From the intertidal zone to 45 m.

This form is characterized by having only right-hand denticles on the cusp of the rhachidian tooth. Though inconspicuous, the character is constant and prevails over the pepper-and-salt colour of the 7 original specimens and the present one, as we have seen a female from Chile which was reddish brown with yellow stipples when alive. The dorsal surface bears soft bosses (Fig. 62). The 3 mm-long and 2.1 mm-broad shell of the animal from Curaçao, and its radula of 53 rows, show that the snail was young. However, the number of denticles is approximately the same as in adult animals, 3–5 on the right side of the rhachidian cusp, 3–5 on the upper cutting edge, and 7–10 on the lower cutting edge of the lateral tooth.

## ZOOGEOGRAPHIC REMARKS

The following 6 species, found only at one place or at Aruba and Curaçao, must be disregarded in making a geographic analysis: *Ildice divae*, *Chromodoris binza*, *Peltodoris hummelincki*, *Doto doerga*, *Coryphella dushia*, and *Moridilla kristenseni*.

Of the remaining 49 species, 14 (28.5%) are Caribbean: *Oxynoe antillarum*, *Polybranchia viridis*, *Cyerce antillensis*, *Elysia ornata*, *E. papillosa*, *Tridachia crispata*, *Pleurobranchus areolatus*, *Discodoris mortenseni*, *Aphelodoris antillensis*, *Polycera herthae*, *Doto divae*, *D. chica*, *Catriona maua*, and *Learchis poica*. Occurrences at the Bermudas (*Elysia ornata*, *E. papillosa*) were considered compatible with a "Caribbean" distribution.

Seventeen (34.7%) species are Caribbean and Brazilian: *Haminoea elegans*, *Chelidonura evelinae*, *Phyllaplysia engeli*, *Bursatella leachii pleii*, *Lobiger souverbiei*, *Stiliger vanellus*, *Elysia cauze*, *Berthella agassizii*, *Cadlina rumia*, *Doris bovena*, *Polycerella conyna*, *Dendrodoris krebsii*, *Hancockia ryrca*, *Doto pita*, *Phidiana lynceus*, *Nanuca sebastiani*, and *Favorinus auritulus*.

To the last group, 3 (6.1%) species can be added, whose Brazilian and Caribbean range extends north to the United States but not beyond North Carolina (Cape Hatteras): *Aplysia cervina*, *Catriona tina*, and *Dondice occidentalis*. Hence the American warm-water species make up 69.3% of the present collection.

In warm and warm temperate water of the Atlantic Ocean, partly also in the Mediterranean Sea, 4 (8.2%) species occur: *Aplysia brasili-ana*, *Stiliger costai*, *Doto cinerea*, and *Favorinus branchialis carneus*.

A group of 7 (14.3%) species is circumtropical and circumsub-tropical, though several of them were rarely or not recorded from the eastern Pacific Ocean. To this group belong: *Chelidonura hirundinina*, *Aplysia parvula*, *A. dactylomela*, *Dolabrifera dolabri-fera*, *Stylocheilus longicauda*, *Scyllaea pelagica*, and *Glaucus atlanticus*.

Of the present collection, 91.8% are more or less pronouncedly thermophile species. Only 4 (8.2%) of the recorded species extend their range to higher latitudes, though none of them is Arctic or Antarctic: *Hermaea dendritica*, *Fiona pinnata*, *Lamellaria perspicua perspicua*, and *Lamellaria perspicua mopsicolor*.

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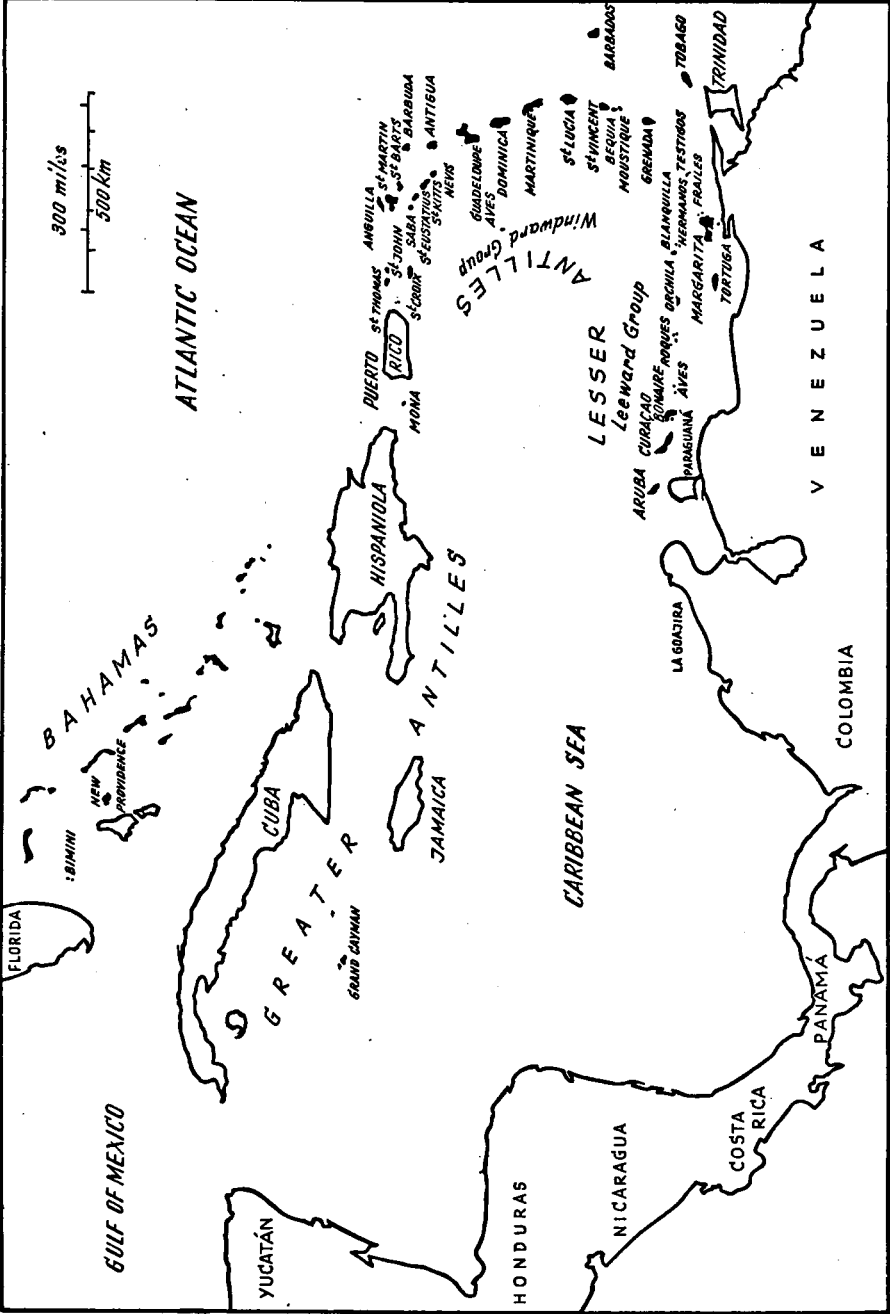


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Sketch map of the Caribbean, showing localities of West Indian Opisthobranchs treated in this paper.

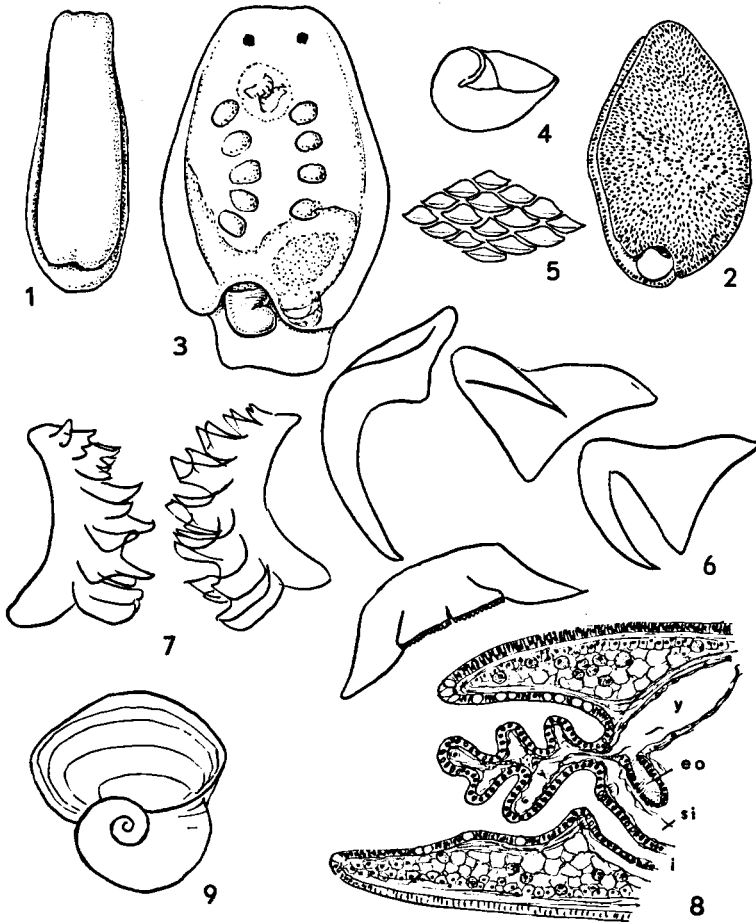


Fig. 1-7. *Ildica divae*, spec. nov., from Curaçao. — 1. Living animal. — 2. Dry specimen. — 3. Softened and clarified snail. — 4. Shell. — 5. Platelets of jaw. — 6. Radula, central tooth and three lateral teeth in different views. — 7. Gizzard plates. — 8. *Runcinidae*-spec.; combined section of branchia. — eo — gonopericardial duct; i — rectum; si — perirectal blood sinus; y — heart.

Fig. 9. *Chelidonura hirundinina* (Q. G.), from Curaçao. — Shell.

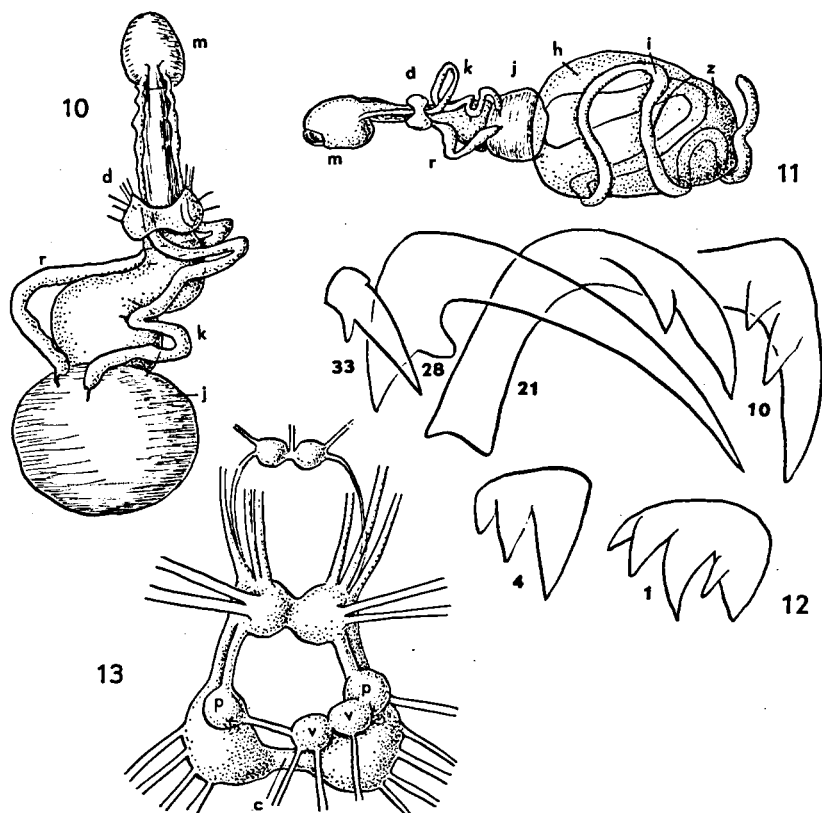


Fig. 10-13. *Stylocheilus longicauda* (Q. G.). — 10. Twisted position of salivary glands; d — nerve ring; j — gizzard; k — left salivary gland; m — buccal bulb; r — right salivary gland. — 11. Alimentary tract; letters as in 10; h — digestive gland; i — intestine; z — gonad. — 12. Radula of adult slug, with numbered lateral teeth. — 13. Central nervous system; c — pedal commissure; p — pleural ganglia; v — visceral ganglia.

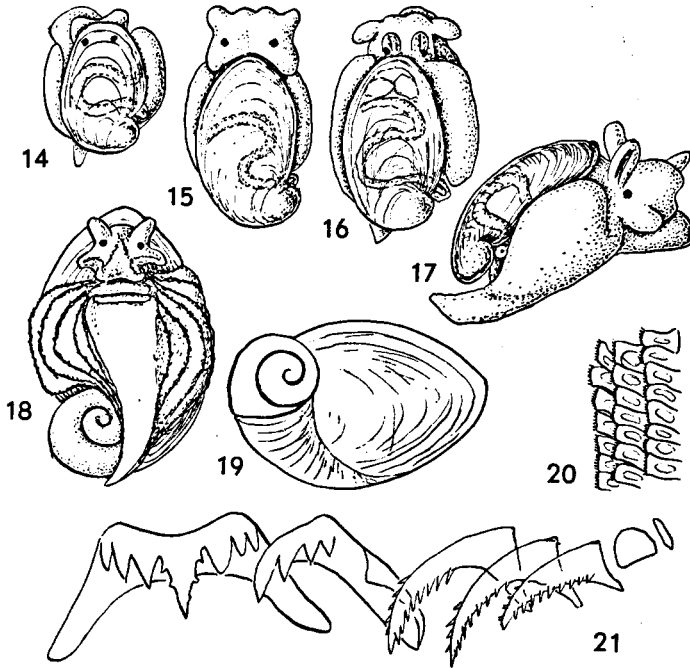


Fig. 14–21. *Stylocheilus longicauda* (Q. G.); young animals from Curaçao. — 14. 0.65 mm long. — 15. 1.0 mm long. — 16. 1.02 mm long. — 17. 1.35 mm long. — 18. Shell with animal, ventral view. — 19. Shell. — 20. Elements of jaw. — 21. Radula.



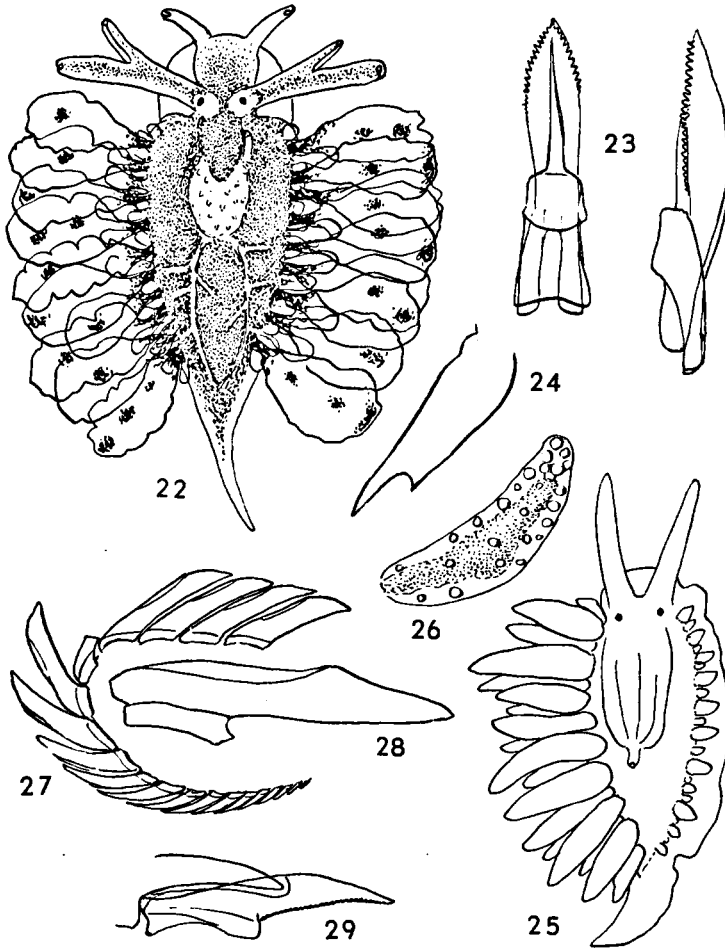
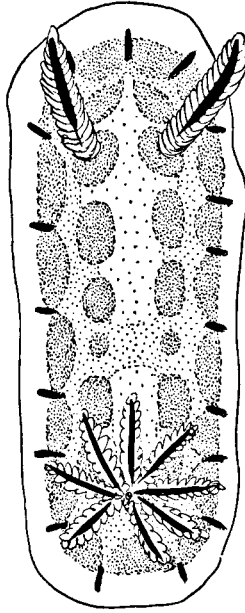
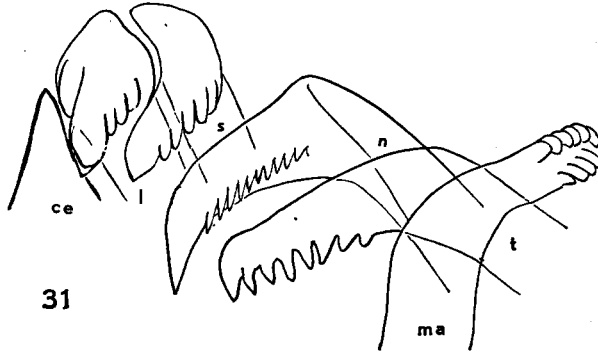


Fig. 22-24. *Cyerce antillensis* Engel, from Curaçao. — 22. Dorsal view of slug. — 23. Radular tooth, frontal and lateral view. — 24. Penial stylet.  
 Fig. 25-26. *Stiliger costai* P.-F., from St. Kitts. — 25. Dorsal view of slug. — 26. Ceras.  
 Fig. 27-28. *Elysia ornata* (Swains.), from Curaçao. — 27. Radula. — 28. Tooth.  
 Fig. 29. *Elysia papillosa* Verr., from Curaçao. — Radular tooth.



30



31

Fig. 30-31. *Chromodoris binza*, spec. nov., from Curaçao. — 30. Dorsal aspect. — 31. Radula; ce - rhachidian thickening; l - first lateral tooth; ma - marginal tooth; n - ninth lateral tooth; s - second lateral tooth; t - twenty-second lateral tooth.

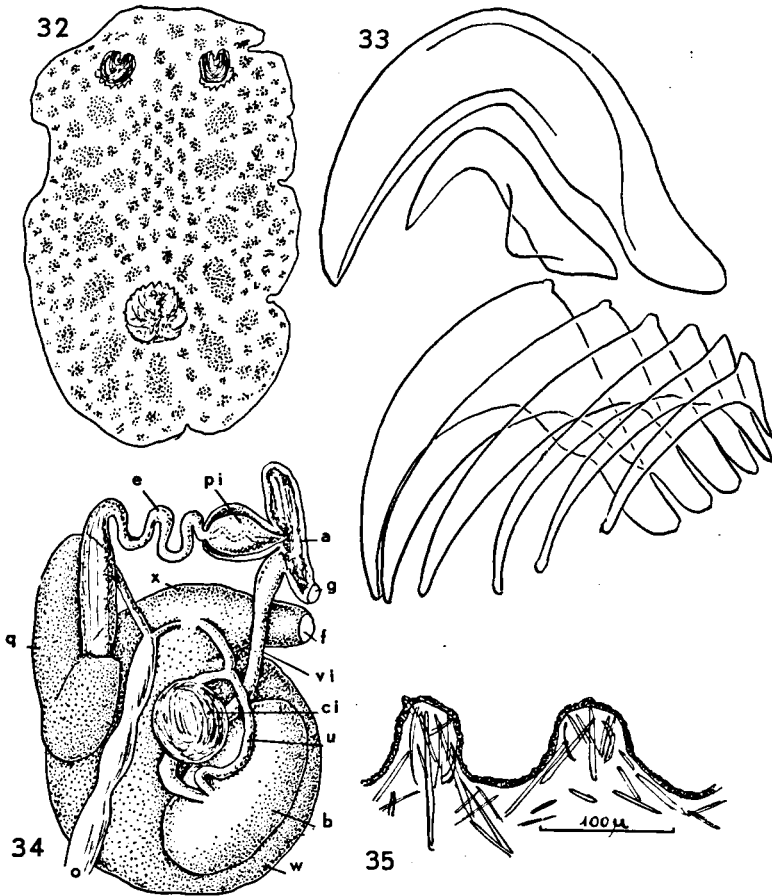
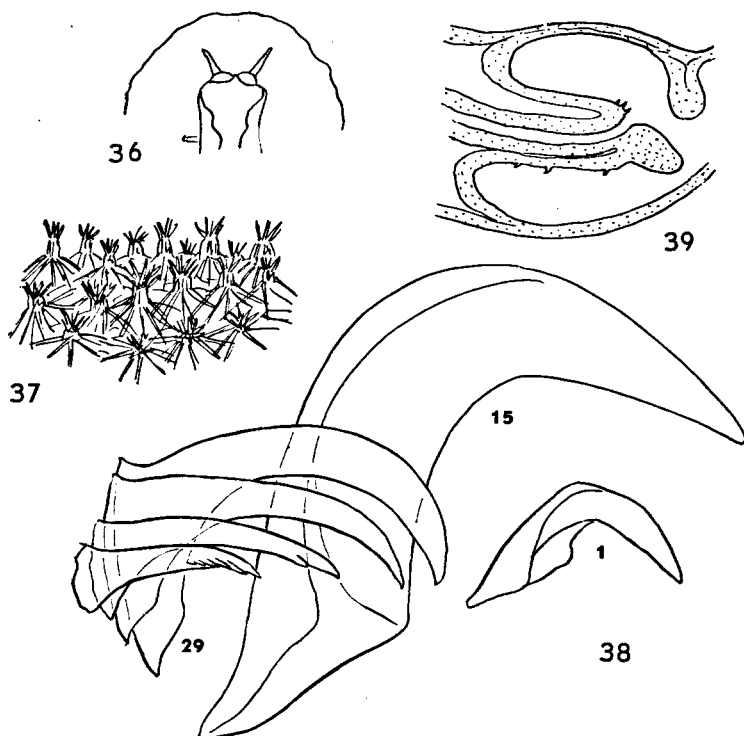
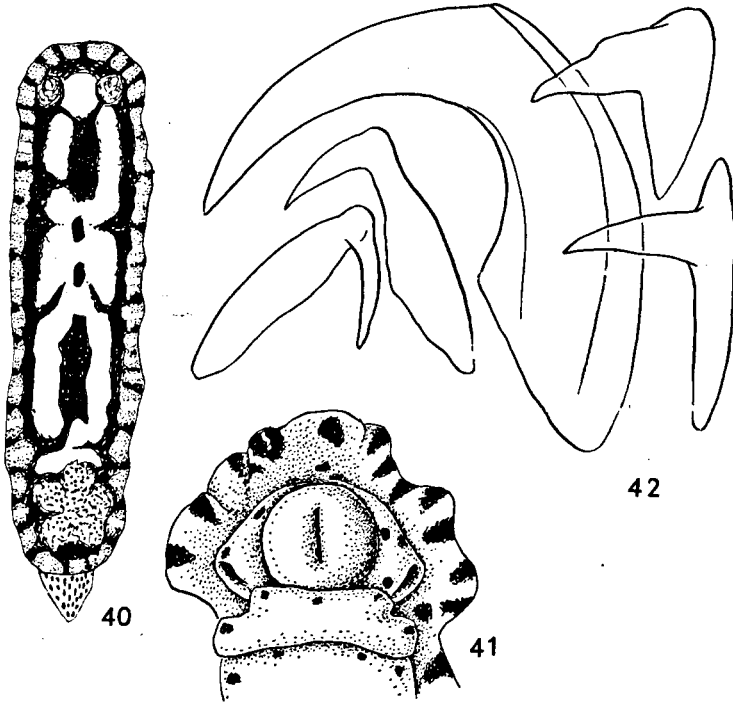


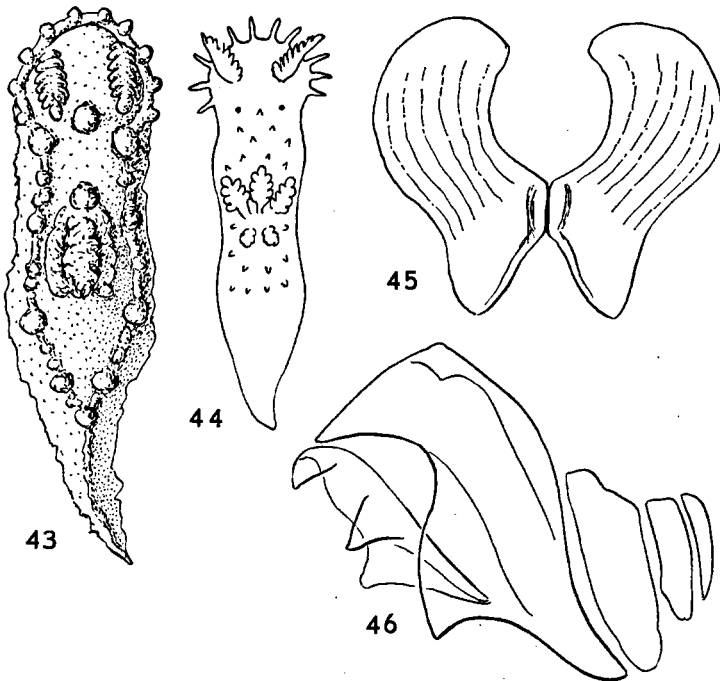
Fig. 32-35. *Pellodoris hummelincki*, spec. nov., from Curaçao. — 32. Dorsal view. — 33. Radula; first tooth and one from middle of row above, outermost teeth below. — 34. Reproductive organs; a — common atrium; b — spermatheca; ci — spermatocyst; e — efferent duct; f — nidamental aperture; g — aperture of atrium; o — ampulla; pi — penial papilla; q — prostate; u — insemination duct; vi — vagina; w — female gland mass; x — nidamental duct. — 35. Section of skin.



Figs. 36–39. *Discodoris mortenseni*, spec. nov., from Curaçao. — 36. Ventral side of fore end. — 37. Notum. — 38. Radular teeth with their numbers. — 39. Penial papilla.



Figs. 40–42. *Aphelodoris antillensis* Bgh., from Curaçao. — 40. Dorsal view; orange colour stippled. — 41. Ventral view of fore end; buccal bulb everted. — 42. Teeth of radula, two innermost ones, one from middle of half-row, and two outermost ones.



Figs. 43–46. *Polycera herthae*, spec. nov. — 43. Dorsal view. — 44. Sketch of living slug. — 45. Jaws. — 46. Half-row of radula.

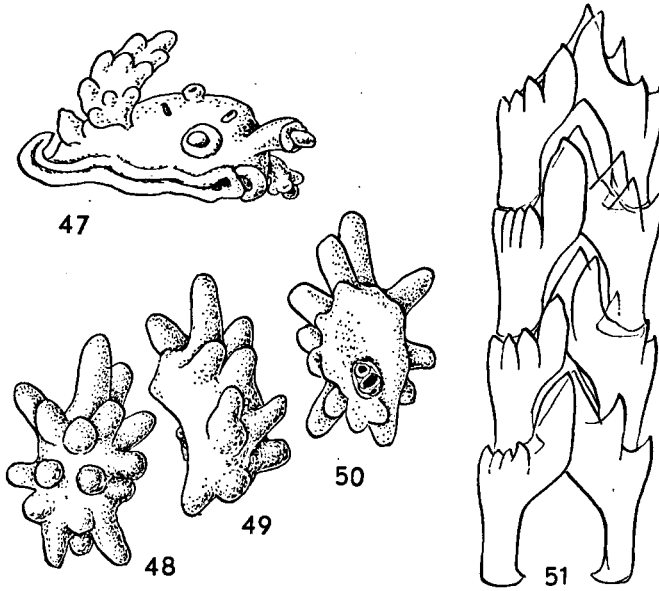


Fig. 47-51. *Doto doerga*, spec. nov., from the Atlantic, near Bermuda. — 47. Side view. — 48. Outer side of ceras. — 49. Lateral view of ceras. — 50. Inner side of ceras. — 51. Radula.

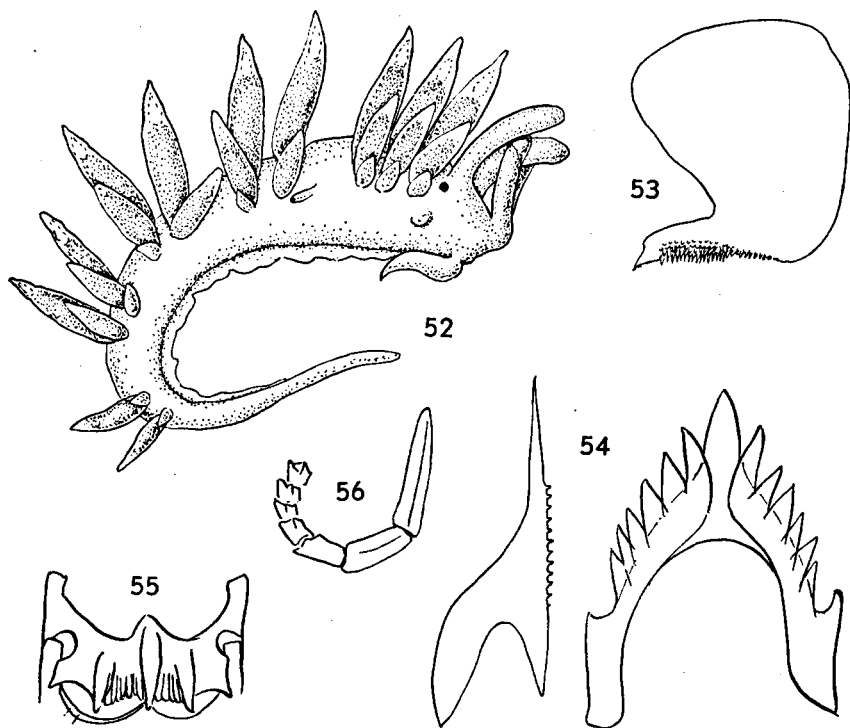


Fig. 52-54. *Coryphella dushia*, spec. nov., from Curaçao. — 52. Side view. — 53. Jaw.  
 — 54. Rhachidian and 1 lateral tooth.  
 Fig. 55-56. *Catriona maua* Marcus, from Bonaire. — 55. Tooth. — 56. Preradula.



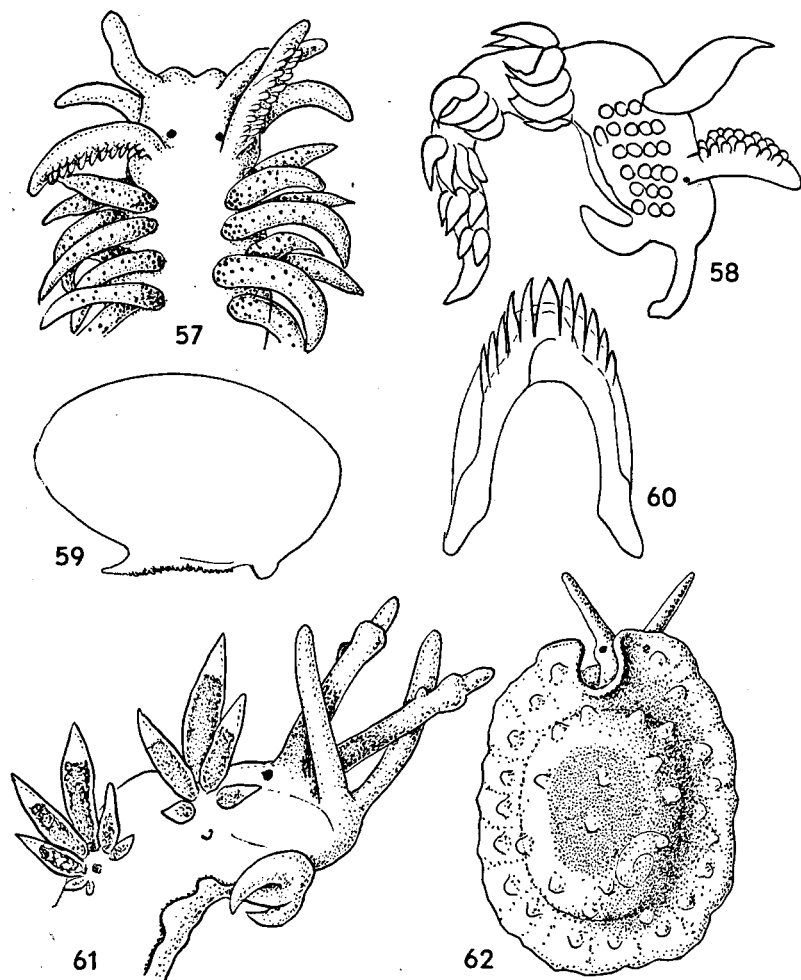


Fig. 57-60. *Moridilla kristenseni*, spec. nov., from Curaçao. — 57. Dorsal view of fore end. — 58. Side view; anterior cerata removed. — 59. Jaw. — 60. Tooth.

Fig. 61. *Favorinus branchialis carneus* (Ald. & Hanc.), from Curaçao. — Side view of fore end.

Fig. 62. *Lamellaria perspicua mopsicolor* d. B.-R. Marc., from Curaçao. — Dorsal view after sketch of living animal.

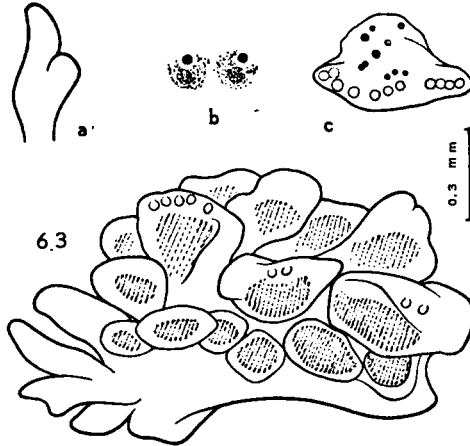


Fig. 63. *Polybranchia viridis* (Desh.), from Bonaire. — Small, rather contracted specimen. a — right rhinophore, as seen from below; b — the black pigmented fields behind the eyes; c — cerata with colourless bodies near its margin and smaller, yellowish grains towards the base (see text, p. 17). (PWH)

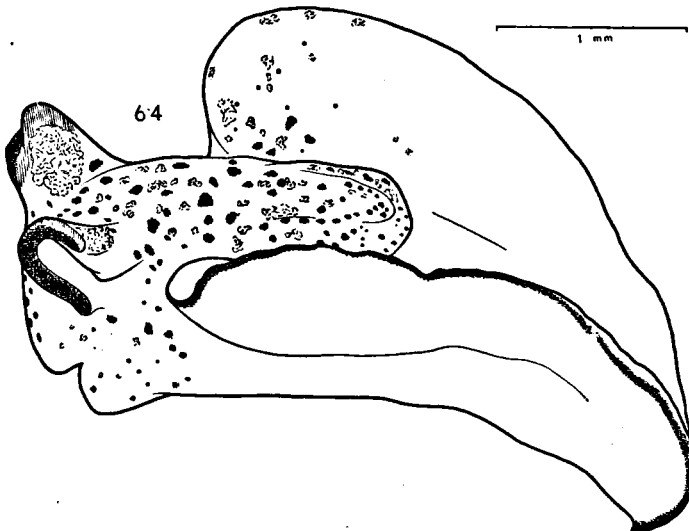


Fig. 64. *Elysia ornata* (Swains.), from Bonaire. — Small, slightly narcotized specimen (see text, p. 21). (PWH)

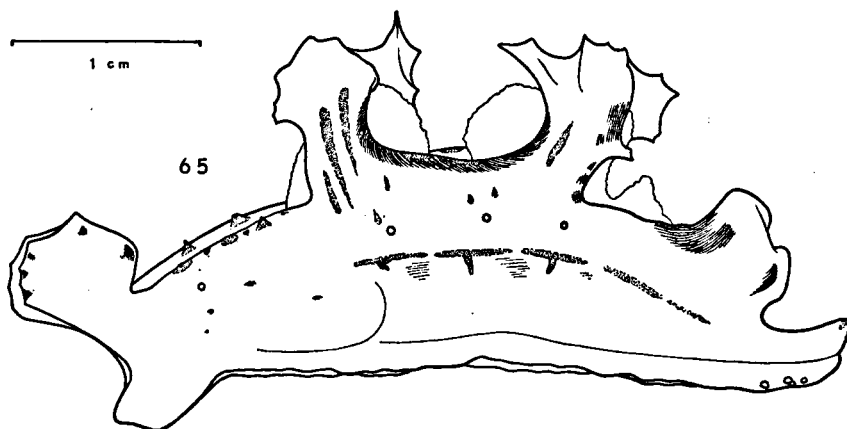


Fig. 65. *Scyllaea pelagica* L., from Bonaire. — Sketch of living specimen with its design of brown (hatched) patches, white (stippled) markings and blue spots (circles) (see text, p. 37). (PWH)

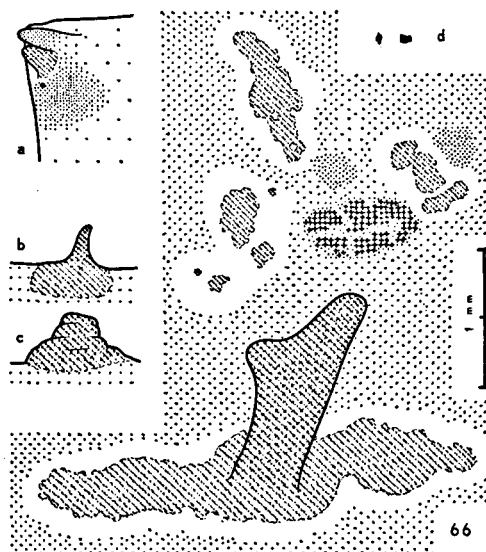


Fig. 66. *Scyllaea pelagica* L. from Bonaire. — Detail of living specimen (cf. Fig. 65): surroundings of the oral one of the three white (hatched) papillae, showing a blue spot (crosses) on a brownish (stippled) field. a — papillae on tail tip; b—c — papillae from behind left rhinophore; d — black eye pigment, from both sides of the head (see text, p. 37). (PWH)

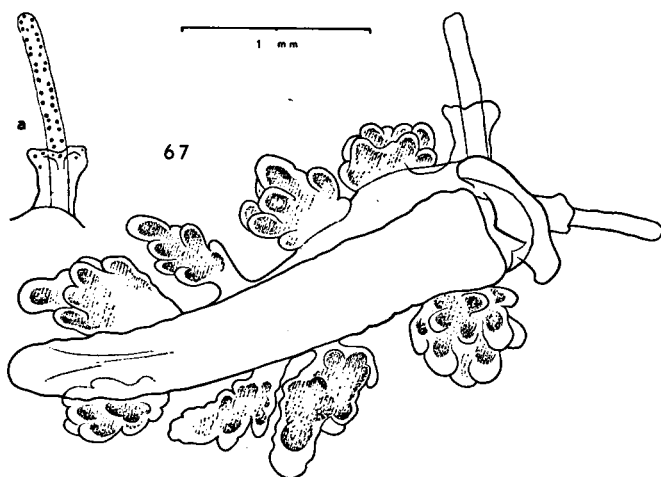


Fig. 67. *Doto divae* Marcus, from Bonaire. — Small specimen in slightly narcotized condition. a — right rhinophore, as seen from below (see text, p. 39). (PWH)

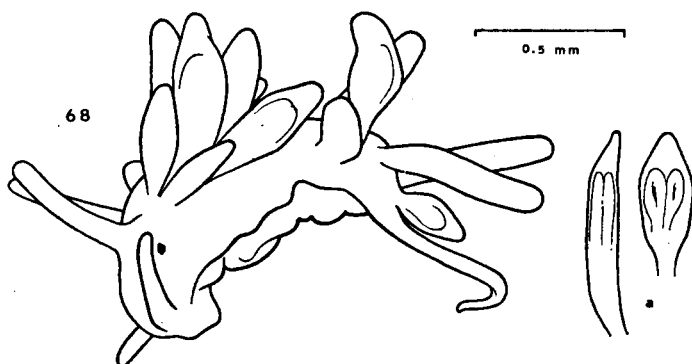


Fig. 68. *Catriona tina* Marcus, from Bonaire. — Slightly narcotized specimen. a — two cerata. (see text, p. 43). (PWH)