

RESEARCH ABSTRACTS FOR 1938

The following abstracts summarize the results of investigations carried on at the laboratory during the summer of 1938. The reports have been edited only to insure uniformity of style and arrangement, but are otherwise in the form contributed by the authors. (For bibliographic reference it is recommended that the following form be used: "Bull. Mt. Desert Is. Biol. Lab., p. —.")

LITTORAL POLYCLADS FROM NEW ENGLAND, PRINCE EDWARD ISLAND, AND NEWFOUNDLAND

A. S. PEARSE AND ALMEDA M. WALKER

Duke University

Since the time of Girard (1893) and Verrill (1893) no work has been done on the polyclads of New England, except for a fine paper on *Hoploplana inquilina* by Wheeler (1894) and a brief note on *Notoplana atomata* by Hyman (1938). During July and August, 1938, we collected at four localities along the coasts of Massachusetts, Maine, Prince Edward Island, and Eastern Newfoundland. In each locality an effort was made to make collections from all littoral habitats where polyclads were likely to be found. Though fourteen species have been reported from the New England coast, we found only five. In carrying on our work we received help from several persons and for this we express our thanks:- Woods Hole, Mass.: Henry A. Walker, Dr. Charles Packard, James McInnis, and George M. Gray; Salsbury Cove, Mt. Desert Island, Me.: Dr. W. H. Cole; Ellerslie, Prince Edward Island: Dr. Alfred H. Needler; and St. Johns, Newfoundland: Nancy Frost. Dr. Libbie Hyman has kindly examined some of our specimens and given valuable opinions.

Conditions along the shores of Mt. Desert Island resembled those on Newfoundland, and the same single species of polyclad was found at both localities. In general the littoral fauna at the former station was very rich and the latter rather barren. The shore fauna of Prince Edward Island included oysters and other southern species. Two species of polyclads were found there. The region about Woods Hole, on the southern shore of Cape Cod, yielded five species. The polyclads along the east coast of North America appear to a collector to grow fewer in passing from south to north, but, if all old records are accepted, about as many species have been reported from New England as from Florida. Temperatures in shore waters

were found to be about as follows: Woods Hole, Mass., July 20, 20°C.; Mt. Desert Id., Me., July 31, 16°C.; Ellerslie Biological Station, P. E. I., August 8, 21-25°C.; Brigus, Newfoundland, August 15, 14°C.

In the following account we give notes on our collections and attempt to summarize all polyclads reported from northeast North America, so that those who encounter specimens may perhaps be able to identify them. Many of the species described by Girard and Verrill need to be restudied. All our specimens have been deposited in the United States National Museum, along with others from North Carolina, Florida, Texas, and other localities. Our collections are treated systematically, rather than by localities. This permits the interpolation of some remarks about specimens in the collections of the Museum, and about the status of those reported by Girard and Verrill. We have therefore listed fifteen species.

ORDER POLYCLADIDA
SUBORDER ACOTYLINA
SECTION CRASPEDOMMATA
FAMILY DISCOCELIDAE

Discocelis mutabilis Verrill

This species has not been found in New England since Verrill reported it among red algae at depths of 1 to 2 fathoms off Thimble Islands, New Haven, Conn. We have collected one specimen at Beaufort among algae at Cape Lookout, N. C. It differs from a Florida species, *D. grisea* Pearse, in color and arrangement of eyes. The southern species is gray and immaculate, and this one is yellowish, speckled with brown. The eye spots in this species form three ill-defined clusters, whereas the southern species they are arranged in two pairs of lateral groups.

FAMILY LATOCESTIDAE

Trigonoporus folium Verrill

This and the next species should be restudied. Verrill reported this species as occurring from Long Island Sound to Eastport, Me.: 0 to 54 fathoms. Verrill identified one specimen of this species which is now in the United States National Museum collections.

Trigonoporus dendriticus Verrill

Verrill (1893) found this species off Cape Cod at a depth of 25 fathoms.

FAMILY STYLOCHIDAE

Stylochus zebra Verrill

This species is readily obtained in the waters about Woods Hole, Mass. Verrill (1893) also reported it from oyster beds in Long Island Sound off New Haven. On July 20 the shells were cracked off 104 hermit crabs from Cotuit Bay on Cape Cod. These were allowed to stand in a jar of sea water overnight and yielded 34 *Stylochus zebra*. The largest of these measured 26 by 6 mm., but Verrill reports lengths of 30 to 40 mm. Some polyclads of this species were also obtained from old empty shells. In shells with hermit crabs the worms are to be found above the body of the crustacean near the apex.

Stylochus frontalis Verrill

This species was found once at Provincetown, Mass., on the bottom of a whaling vessel which had recently returned from a cruise to the Carolina coast (Verrill 1893).

Eustylochus ellipticus Verrill

This species was reported by Verrill (1893) as being common from New Haven, Conn., to Casco Bay, Me. He observed that it was associated with barnacles, and ate them. We collected two specimens in Massachusetts; one from shells dredged at five fathoms off Vineyard Haven and the other from barnacles scraped from the harbor service wharf at Woods Hole. There are three specimens in the United States National Museum from Cape Cod; 1879, 1882. We collected five specimens at Ellerslie, P. E. I., August 4 and 7, from eel grass. Barnacles are very few there.

SECTION SCHEMATOMMATA

FAMILY LEPTOPLANIDAE

Leptoplana angusta Verrill

In the United States National Museum are two mounted specimens, one from the Bay of Fundy and the other from St. Joe Bay, Florida; lengths: 13 and 14 mm. Verrill (1893) found specimens on a vessel that had recently cruised to the Carolina coast at Provincetown, Mass. We recently found one at Beaufort, N. C., off Cape Lookout. Dr. Hyman has examined some specimens examined by Verrill and does not believe our specimens belong to his species.

Leptoplana virilis Verrill

Verrill (1893) had only two specimens from depths of 13.5 and 31 fathoms off Cape Cod. In the United States National Museum there is a specimen collected on Cosbourg Island, Baffin Bay, August 3, 1935, by Capt. Robt. A. Bartlett. This, mounted, measures 21.5 by 11 mm.; a little larger than Verrill's specimens.

Notoplana atomata (O. F. Müller)

This species, as Hyman (1938) has pointed out is identical with *Leptoplana variabilis* (Girard) and *Leptoplana ellipsoid* (Girard). Verrill (1893) reported this as ranging from Vineyard Sound, Mass., to Eastport, Me.; low-water mark to 42 fathoms or more. We found it along the rocky shores of Mt. Desert Island and at Brigus, Newfoundland. At the former locality it was somewhat larger (largest specimen, extended: 15.2 by 5.1 mm.) than along the Newfoundland coast (7 by 2.3 mm.) and had more mature, and apparently more functional, sex organs. It was especially abundant among algae (*Ulva*, *Chondrus*) in tide pools, but was also found at times under stones. From one pail of *Chondrus* at Brigus 56 specimens were taken. Those collected at Mt. Desert Island were light tan; margins translucent; with many brown and light spots, the latter irregular in outline; in the middle third, an elliptical dark region; area over brain, unpigmented.

Stylochoplana oculifera (Girard)

This species was reported by Verrill (1893) from Buzzard's Bay at Quisset Harbor, in 4 to 5 fathoms, on a sandy bottom. This is Verrill's *Imogene oculifera* and Dr. Hyman believes it should be called *Gnesioceros verrilli*.

Hoploplana inquilina (Wheeler)

This commensal polyclad is not uncommon at Woods Hole, Mass., where on July 20 we secured five specimens by cracking open and searching through about 150 living *Bucycons*. The worms usually lurk in folds of the mantle.

FAMILY PLANOCERIDAE

Planocera nebulosa Girard

Verrill (1898) found this species uncommon alongshore in Connecticut, Rhode Island, and Massachusetts.

FAMILY STYLOCHOCESTIDAE

Euplana gracilis (Girard)

As this species was described from the west coast of Florida (Pearse 1938) it was a surprise to find it rather common at Ellerslie, Prince Edward Island. The largest specimen measured 12.2 mm. long by 1.9 mm. wide; which is much larger than any Florida specimens in the National Museum collection. Seventeen specimens were collected at Ellerslie among algae (*Ulva*, *Gracilaria*) and among old shells. Two specimens (largest, 7 by 1 mm.) were collected from bridge piles at Vineyard Haven, Mass., July 20, 1938. The color of these was mottled brown with an irregular median stripe extending through the posterior three fourths of the body.

SUBORDER COTYLINA

FAMILY EURYLEPTIDAE

Eurylepta maculosa Verrill

Verrill (1893) found this worm occasionally about Woods Hole, Mass., on piles and among algae. Verrill's type specimen (in very poor condition) is in the collection of the United States National Museum.

FAMILY PROSTHIOSTOMIDAE

Prosthiostomum gracile Girard

No mature specimens of this species were found by Girard or Verrill (1893), who reported it from Connecticut and Massachusetts.

KEY TO LITTORAL POLYCLADS

REPORTED FROM NEW ENGLAND

- | | | | |
|---------|--|---|----|
| 1 (26) | Without ventral sucker or marginal tentacles | Suborder Acotylea, | 2 |
| 2 (13) | With marginal eyes; male genital organs directed posteriorly, no cirrus; nuchal tentacles present or absent; uteri never fuse anterior to pharynx | | 3 |
| 3 (4) | Nuchal tentacles absent; pharynx long, central, frilled; color yellowish-brown, with or without darker median band... <i>Discocelis mutabilis</i> Verrill | | 5 |
| 4 (3) | Nuchal tentacles present | | 6 |
| 5 (8) | With 3 genital openings; nervous system reddish in life | | 6 |
| 6 (7) | Size large, 20 to 25 mm. by 10 to 15 mm.; color yellowish, pale over pharynx | <i>Trigonoporus folium</i> Verrill | |
| 7 (6) | Size small, 12 to 15 mm. by 6 to 8 mm.; color yellow or pink | <i>Trigonoporus dendriticus</i> Verrill | |
| 8 (5) | With 2 genital openings | | 9 |
| 9 (12) | Genital openings at least a seventh of body length from posterior end | Genus <i>Stylochus</i> , | 10 |
| 10 (11) | Body when extended 30 to 40 mm. long and 10 to 12 mm. wide, rounded at ends; pharynx mostly anterior to middle, mouth at end of anterior third; color yellowish brown with numerous transverse light stripes, sometimes with a light median band; usually in <i>Fulgur</i> shells. <i>Stylochus zebra</i> Verrill | | |
| 11 (10) | Body when extended usually not much more than three times as long as wide; pharynx with 5 pairs of lateral lobes; tentacles short and obtuse; color yellowish-gray with brown spots at margin | <i>Stylochus frontalis</i> Verrill | |

- 12 (9) With genital openings very close together and less than a twentieth of body length from posterior end; body 20 by 6 mm.; reddish-brown or reddish, pattern reticulate *Eustylochus ellipticus* (Girard)
- 13 (2) Without marginal eyes, and eyes that are present far from anterior margin 14
- 14 (23) Uteri united anterior to pharynx 15
- 15 (20) No nuchal tentacles; body elongated, elliptical in outline; margin more or less folded 16
- 16 (17) With about 12 pairs of pharyngeal lobes; color light brown with darker median streak; length 12 to 16 mm., width 4 to 6 mm. *Leptoplana angusta* Verrill
- 17 (16) With 6 or fewer pairs of pharyngeal lobes 18
- 18 (19) Mouth anterior to middle of pharynx; color pale brown with darker flecks; size 18 by 10 mm.; from deep waters *Leptoplana virilis* Verrill
- 19 (18) Mouth about in middle of pharynx; color variable, yellowish-brown, salmon, greenish *Notoplana atomata* (O. F. Müller)
- 20 (15) With nuchal tentacles 21
- 21 (22) Body elliptical with somewhat pointed ends; in Busycon shells *Hoploplana inquilina* (Wheeler)
- 22 (21) Body wide at anterior end, tapering to a point posteriorly; very active, often swim; color bright red with light margins on which are pale yellow spots *Stylochoplana oculifera* (Girard)
- 23 (14) Uteri not united anterior to pharynx 24
- 24 (25) Body when extended three to six times as long as wide; mouth and pharynx in anterior half of body; uteri fused posteriorly; enteron anastomosed in posterior half of body *Euplana gracilis* (Girard)
- 25 (24) Body round-oval; genital pores not close to posterior end; mouth and pharynx central; body 29 by 10 mm.; color olive green with median dorsal stripe *Planocera nebulosa* Girard
- 26 (1) With a sucker behind the pharynx, which may be frilled, folded, or tubular; often with marginal tentacles Suborder Cotylea, 27
- 27 (28) Marginal tentacles conical, slender; color yellow with brown spots; size 15 by 10 mm. *Eurylepta maculosa* Verrill
- 28 (27) No marginal tentacles; body elongate, 4 by 1.25 mm.; marginal eyes across anterior margin and four groups of tentacular, cerebral, and frontal eyes; pharynx tubular; mouth close behind brain *Prosthlostomum gracile* Girard

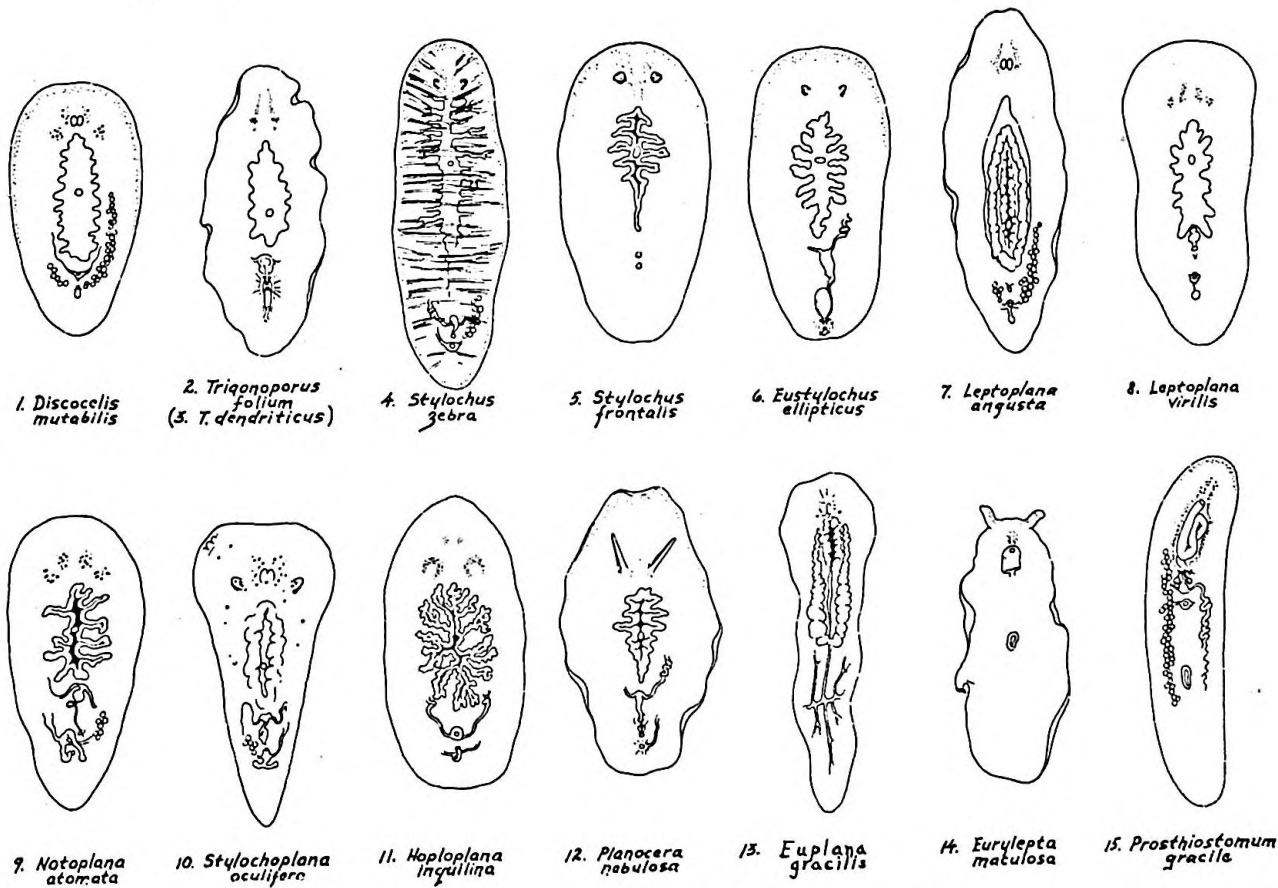


FIG. 1.—Sketches to show identification characters of fourteen of the fifteen species of polyclads reported from New England, Canada, and Newfoundland. Drawn by James W. Littler from Verrill (1893) and sketches made by Almeda M. and H. A. Walker.

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RHIZOCEPHALA IN MAINE

ALMEDA M. WALKER AND A. S. PEARSE

Duke University

Rhizocephalan barnacles have been collected on the coast of Europe, the British Islands, and Greenland but have not been found on the Atlantic coast of North America, though early naturalists made vague reports of their occurrence (Boschma 1928). Dr. Edward Reinhard informed us that he had found peltogastrids on hermit crabs in the Mt. Desert region and at his suggestion we visited Googan's Ledge.

Alongshore we collected 30 hermit crabs on August 1, 1938. Of these 29 proved to be *Pagurus pubescens* Kröyer and one was *P. acadianus* Benedict. Ten of the former bore 11 rhizocephalans on their abdomens, one having two of the parasites. These were more or less sausage shaped and usually curved (Fig. 1). Their sizes and colors are shown in Table 1. Number 8 was apparently a spent individual and Number 9 was shriveled:

TABLE 1. *Peltogaster paguri* Rathke collected on Googan's Ledge, near Mt. Desert Island, Maine; August 1, 1938.

No.	Length of hosts' ~		Peltogaster		Color
	carapace, mm.	Length, mm.	Width, mm.		
1	20.0	13.2	7.7		Red-orange
2	19.0	13.0	5.8		Red-orange
3	18.0	21.0	9.0		Cream-reddish
4	18.0	6.3	2.2		Red
5	16.5	17.0	9.5		Brown-red
6	15.3	17.0	9.5		Brown-red
7	15.0	16.5	8.5		Red-brown
8	15.0	10.0	2.3		Black
9	14.0	8.5	3.8		Red-cream
10	13.0	{ 10.5	5.6		Cream-red
		{ 9.0	4.5		Red-brown

The rhizocephalan was identified as *Peltogaster paguri* Rathke (Family Peltogastridae), and this was confirmed by Dr. H. Boschma, to whom specimens were submitted. This parasite has previously been reported as infesting *Pagurus*