

Homalometron dowgialloi sp. n. (Homalometridae) from *Haemulon flavolineatum* and Additional Records of Digeneric Trematodes of Marine Fishes in the West Indies

WILLIAM G. DYER,¹ ERNEST H. WILLIAMS, JR.,² AND LUCY BUNKLEY-WILLIAMS²

¹ Department of Zoology, Southern Illinois University, Carbondale, Illinois 62901-6501 and

² Caribbean Aquatic Animal Health Project, Department of Marine Sciences, University of Puerto Rico, P.O. Box 908, Lajas, Puerto Rico 00667-0908

ABSTRACT: A total of 345 marine fishes representing 27 families, 31 genera, and 44 species from the coastal waters of southwestern Puerto Rico and Mona and Desecheo islands was examined for digeneans. Forty-five species of digeneans were identified including *Homalometron dowgialloi* sp. n. from the French grunt, *Haemulon flavolineatum* (Desmarest) (Haemulidae); 14 others were identified to genus. *Homalometron dowgialloi* differs from all known species of *Homalometron* in possessing an irregularly lobed ovary and vitellaria commencing at the equatorial level of the acetabulum. It is most similar to *H. caballeroi* and *H. armatum*, but differs from the former in having a prepharynx shorter than the pharynx, a proportionally shorter posttesticular space, noncontiguous testes, and smaller eggs and differs from the latter in being smaller, in having a larger sucker width ratio, and smaller eggs. Forty-one new host records and 2 new geographic locality records were reported. Most infections were of a single species and of low intensity.

KEY WORDS: *Homalometron dowgialloi*, Digenea, marine fish, Puerto Rico, Mona Island, Desecheo Island.

Initial reports on digeneans of marine fishes of Puerto Rico include the studies conducted by Cable (1954a, b, 1956a, b) and Le Zotte (1954). A more comprehensive survey was conducted later by Siddiqi and Cable (1960). More recently, Dyer et al. (1985) examined 1,019 marine fishes representing 76 families, 155 genera, and 252 species from the western and southwestern coasts of Puerto Rico. Nineteen families of digeneans representing 52 genera and 66 species were recorded including 4 new host records and 11 new geographic locality records.

The present study is a follow-up, especially in an attempt to examine additional fishes reported earlier as negative. Additional data were obtained from examining 345 marine fishes representing 27 families, 31 genera, and 44 species from coastal waters of southwestern Puerto Rico and Mona and Desecheo islands between November 1974 and August 1990.

Materials and Methods

Collection methods utilized throughout this study varied and included such techniques as variable mesh gill net, trawl net, seine, traps, spearfishing, and hook and line supplemented by quinaldine and rotenone to obtain species inhabiting reefs and shallow water. Fishes were placed in plastic bags containing seawater and transported to the laboratory where they were refrigerated and usually necropsied immediately.

Digeneans were washed in 0.7% saline, fixed with warm alcohol-formaldehyde-acetic acid (AFA), and stored in 70% ethanol. Specimens were stained with

either Harris' hematoxylin or Grenacher's alcoholic borax carmine and prepared as whole mounts in Canada balsam. Voucher specimens of most species have been deposited in the National Parasite Collection, USDA, Beltsville, Maryland, as noted. The illustration was made with the aid of a camera lucida and a microprojector; measurements are in micrometers unless otherwise stated, with the range followed by the mean in parentheses.

Description

Homalometridae (Cable and Hunninen, 1942) Yamaguti, 1971

Homalometron dowgialloi sp. n. (Fig. 1)

DIAGNOSIS (based on 3 adult specimens): Elongate, spinulate distome with body tapering anteriorly, rounded posteriorly, 0.86-1.82 (1.24) mm long, 250-500 (336) wide at level of acetabulum. Oral sucker subterminal, 101-200 (141) long, 95-175 (125) wide. Acetabulum pre-equatorial, 183-286 (233) long, 184-350 (238) wide. Sucker length ratio 1:1.58-1.81 (1.66), width ratio 1:1.93-2.00 (1.98). Prepharynx 11-26 (17) long; pharynx 77-100 (81) long, 46-57 (52) wide; esophagus 33-56 (35) long, 23-44 (37) wide; ceca narrow, terminating subequally, 75-130 (100) from posterior extremity. Testes 2, smooth, tandem in posterior half of body; anterior testis round, 101-154 (125) long, 70-160 (114) wide; posterior testis longitudinally elongate, 101-200 (148) long, 79-148 (104) wide; posttesticular

space 260–340 (278) representing 17–30 (20) percent of total body length. Cirrus sac absent; seminal vesicle sacular, dorsosinestral to midline, 100–132 (125) long, 70–74 (72) wide, commencing at posterior margin of acetabulum, terminating at mid-level; prostatic complex inconspicuous. Genital pore median, immediately preacetabular. Ovary pretesticular, irregularly lobed, dextromedian, slightly overlapping cecum, 88–117 (102) long, 48–99 (78) wide. Seminal receptacle preovarian, 75–114 (98) long, 30–48 (42) wide. Mehlis' gland median, preovarian; Laurer's canal not observed; vitellaria commencing at equatorial level of acetabulum, extending uninterrupted to posterior end of body, follicles overlapping ceca ventrally at testicular level, fields confluent posttesticularly; vitelline reservoir posterior to Mehlis' gland. Uterus overlapping ceca, coils between anterior testis and posterior third of acetabulum, overlapping ovary, seminal vesicle, and seminal receptacle; hermaphroditic duct short. Eggs in utero ($N = 20$), 44–52 (48) by 31–38 (33) wide. Excretory pore terminal, excretory vesicle tubular, extending from posterior end of body to terminus of posterior testis.

TYPE HOST: *Haemulon flavolineatum* (Desmarest) (Perciformes: Haemulidae); French grunt.

TYPE LOCALITY: La Parguera, Puerto Rico.

SITE: Small intestine.

HOLOTYPE: USNM Helm. Coll. No. 81658.

PARATYPE: USNM Helm. Coll. No. 81659.

ETYMOLOGY: Names for Michael Joseph Dowgiallo in recognition of his contributions to helminthology.

Remarks

Species of *Homalometron* have been reported from marine, brackish, and freshwater fishes. Yamaguti (1971) listed 7 species: *H. pallidum* Stafford, 1904; *H. armatum* (MacCallum, 1895) Manter, 1947; *H. caballeroi* Lamothe Argumedo, 1965; *H. elongatum* Manter, 1947; *H. longulum* Travassos, Freitas, and Buhrnheim, 1965; *H. pearsei* (Hunter and Bangham, 1932) Manter, 1947; and *H. sophiae* (Stossich, 1886) Yamaguti, 1970. Miller (1959) redescribed *H. armatum* on the basis of 250 specimens collected from *Aplodinotus grunniens* (Rafinesque), *Lepomis humilis* (Girard), and *L. microlophus* (Günther) from Louisiana and designated *H. pearsei* as a synonym of *H. armatum* because of the large amount of variation occurring within the descriptions given for the 2 species.

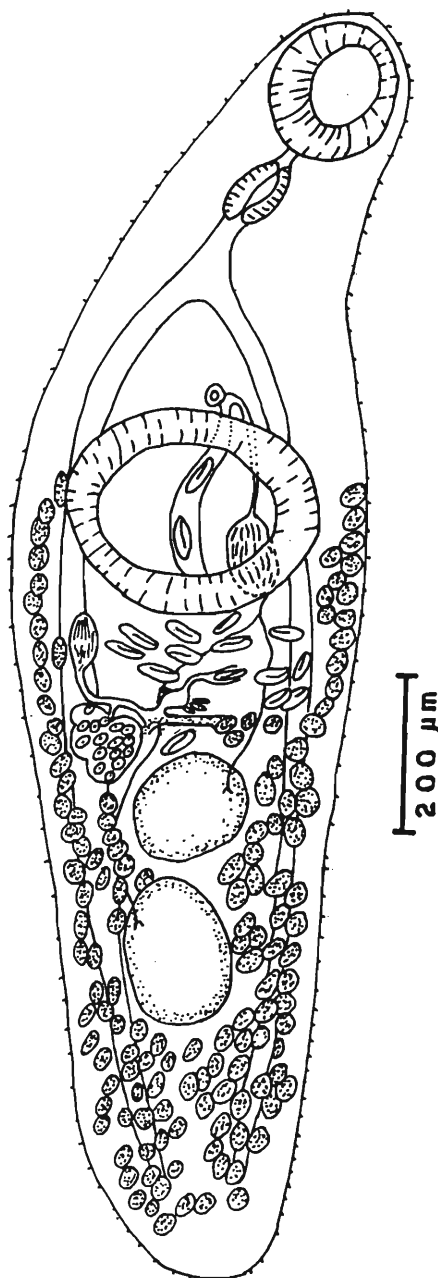


Figure 1. *Homalometron dowgialloi* sp. n. Ventral view of holotype.

Four additional species have been proposed as *Homalometron* subsequently: *H. foliatum* Siddiqi and Cable, 1960; *H. senegalense* Fischthal and Thomas, 1972; *H. carapevae* Amato, 1983; and *H. pseudopallidum* Martorelli, 1986. The presence of a prominent lymphatic system de-

Table 1. Digenetic flukes of marine fishes from coastal waters of Puerto Rico.

Host (no. examined/ no. infected)	Parasite	Locality, date	No. hosts ex- amined/no. in- fected/avg. no. worms per in- fected host	USNM Helm. Coll. No.
Bony fishes				
Acanthuridae (surgeonfishes)				
<i>Acanthurus bahianus</i> Castelnau (2/2)	<i>Hysterolecitha rosea</i> Linton, 1910	Sardinero, Mona Island, 22 April 1976	1/1/1	81569
	* <i>Schikhobalotrema manteri</i> Siddiqi and Cable, 1960	La Parguera, 2 December 1977	1/1/1	81570
<i>Acanthurus chirurgus</i> (Bloch) (8/3)	<i>Dichadena acuta</i> Linton, 1910	La Parguera, 1 August 1990	7/2/8	81571
	<i>Sterrhurus</i> sp.	La Parguera, 10 February 1976	1/1/1	81572
Anomalopidae (flashlight fishes)				
<i>Kryplophanaron alfredi</i> Silvester and Fowler (1/1)	<i>Deretrema</i> sp.	Marganta reef, La Parguera, 11 April 1978	1/1/1	81573
Balistidae (leatherjackets)				
<i>Balistes vetula</i> Linnaeus (1/1)	* <i>Lepidapedon truncatum</i> So- gandares-Bernal, 1959	Mona Island, 12 April 1975	1/1/15	81574
Bothidae (lefteye flounder)				
<i>Bothus lunatus</i> (Linnaeus) (4/2)	* <i>Lecithochirium microcerus</i> (Manter, 1947)	Mona Island, 14 February 1975	1/1/10	81575
	* <i>Leurodera decora</i> Linton, 1910	Mona Island, 14 February 1975	1/1/1	81576
	* <i>Myzoxenus lachnolaimi</i> Manter, 1947	Mona Island, 12 April 1975	1/1/6	81577
Carangidae (jacks)				
<i>Caranx hippos</i> (Linnaeus) (2/2)	* <i>Prosorhynchus stunkardi</i> Siddiqi and Cable, 1960	La Parguera, 17 April 1976	1/1/1	81578
	* <i>Stephanostomum sentum</i> (Linton, 1910)	La Parguera, 17 March 1976	1/1/1	81579
<i>Chloroscombrus chrysurus</i> (Linnaeus) (2/1)	* <i>Elytrophallus chloroscombri</i> (Siddiqi and Cable, 1960)	La Parguera, 17 April 1976	2/1/7	81580
Coryphaenidae (dolphins)				
<i>Coryphaena hippurus</i> Linnaeus (4/3)	<i>Dinurus</i> sp.	La Parguera, 14 February 1976	2/1/2	81581
	<i>Dinurus tornatus</i> Rudolphi, 1819	La Parguera, 20 March 1976 La Parguera, 2 February 1975	1/1/1 1/1/1	81582
Diodontidae (porcupinefishes)				
<i>Diodon hystrix</i> Linnaeus (2/2)	<i>Opistholebes diodontis</i> Cable, 1956	Enrique reef, La Parguera, 3 May 1975	1/1/8	81586
		Enrique reef, La Parguera, 3 March 1988	1/1/2	
Ephippidae (spadefishes)				
<i>Chaetodipterus faber</i> (Broussonet) (2/2)	<i>Apocreadium foliatum</i> (Siddiqi and Cable, 1960) Over- street, 1969	Caracoles reef, La Parguera, 17 November 1974	1/1/1	81583
	<i>Lecithaster</i> sp.	Mario reef, La Parguera, 24 February 1976	1/1/6	81584
Exocoetidae (flyingfishes)				
<i>Cypselurus</i> sp. (1/1)	<i>Diplomonorcheides</i> sp.	Mona Island, 21 April 1976	1/1/5	81585
Gobiidae (gobies)				
<i>Nes longus</i> (Nichols) (2/2)	* <i>Horatrema crassum</i> Manter, 1947	Laural reef, La Parguera, 11 August 1976	1/1/1	81587
	<i>Lepocreadium</i> sp.	Laural reef, La Parguera, 8 February 1977	1/1/1	81588

Table 1. Continued.

Host (no. examined/ no. infected)	Parasite	Locality, date	No. hosts ex- amined/no. in- fected/avg. no. worms per in- fected host	USNM Helm. Coll. No.
Haemulidae (grunts)				
<i>Haemulon carbonarium</i> Poey (3/2)	* <i>Lecithochirium microcercus</i>	San Cristobal reef, La Par- guera, 24 February 1976	1/1/1	81589
	* <i>Leurodera decora</i>	La Parguera, 5 September 1984	2/1/5	81590
	* <i>Myzoxenus lachnolaimi</i>	Turumotte reef, La Par- guera, 5 September 1984	2/1/1	81591
<i>Haemulon chrysargy- reum</i> Günther (1/1)	* <i>Lecithochirium microcercus</i>	Media luna reef, La Parguera, 15 September 1978	1/1/1	81592
<i>Haemulon flavolineatum</i> Desmarest (234/221)	<i>Apocreadium foliatum</i>	La Parguera, 15 October 1976–15 October 1977	210/90/3	81593
		Mona Island, 15 October 1976–15 October 1977	5/4/4	
	<i>Apopodocotyle oscitans</i> (Lin- ton, 1910)	La Parguera, 15 October 1976–15 October 1977	210/109/8	81594
		Mona Island, 15 October 1976–15 October 1977	5/3/5	
	<i>Brachyphallus parvus</i> (Man- ter, 1947)	La Parguera, 15 October 1976–15 October 1977	201/1/1	
	<i>Derogenes crassus</i> Manter, 1934	La Parguera, 16 November 1977	1/1/1	81595
	<i>Diplangus paxillus</i> Linton, 1910	La Parguera, 15 October 1976–15 October 1977	210/76/2	
	<i>Homalometron dowgialloi</i> sp. n.	La Parguera, 28 October 1976	11/11/4	81658 81659
	<i>Infundibulostomum spinatum</i> Siddiqi and Cable, 1959	La Parguera, 15 October 1976–15 October 1977	210/59/6	81596
		Mona Island, 15 October 1976–15 October 1977	5/2/1	
	<i>Leurodera decora</i>	La Parguera, 15 October 1976–15 October 1977	210/138/5	81597
		Mona Island, 15 October 1976–15 October 1977	5/5/5	
	<i>Postmonorchis orthopristis</i> Hopkins, 1941	La Parguera, 15 October 1976–15 October 1977	210/54/8	81598
	<i>Pseudoplagiaporus brevivitel- lus</i> Siddiqi and Cable, 1960	La Parguera, 6 September 1976	6/6/4	81599
	<i>Stephanostomum sentum</i> (Linton, 1910)	La Parguera, 15 October 1976–15 October 1977	210/2/2	
<i>Haemulon plumieri</i> (La- cépède) (3/2)	<i>Diplangus ovalis</i> (Siddiqi and Cable, 1960)	Ensenada, 5 March 1977	2/1/6	81600
	<i>Genolopa ampullacea</i> Linton, 1910	Ensenada, 8 March 1977	1/1/1	81601
	* <i>Leurodera decora</i>	Ensenada, 5 March 1977	2/1/1	81602
<i>Haemulon sciurus</i> (Shaw) (4/4)	* <i>Apocreadium foliatum</i>	Mona Island, 15 April 1975	1/1/1	81603
	* <i>Cainocreadium lintoni</i> (Sid- diqi and Cable, 1960)	Mona Island, 15 April 1976	1/1/1	81604
	<i>Lepocreadium</i> sp.	Laural reef, La Parguera, 25 February 1975	1/1/3	81605
	* <i>Leurodera decora</i>	Mona Island, 15 April 1975	3/3/2	81606
	Holocentridae (squirrel- fishes)			
<i>Holocentrus rufus</i> (Wal- baum) (1/1)	* <i>Leurodera decora</i>	La Parguera, 22 January 1975	1/1/3	81607

Table 1. Continued.

Host (no. examined/ no. infected)	Parasite	Locality, date	No. hosts ex- amined/no. in- fected/avg. no. worms per in- fected host	USNM Helm. Coll. No.
Istiophoridae (billfishes)				
<i>Makaira nigricans</i> La- cépède (2/1)	<i>Hirudinella</i> sp.	La Parguera, 29 January 1975	1/1/1	81608
Kyphosidae (sea chubs)				
<i>Kyphosus incisor</i> (Cu- vier) (3/1)	* <i>Brachyphallus parvus</i> (Man- ter, 1947)	La Parguera, 29 October 1984	1/1/3	81609
<i>Kyphosus sectatrix</i> (Lin- naeus) (4/2)	<i>Apocreadium foliatum</i>	Mona Island, 14 December 1975	1/1/6	81610
	* <i>Enenterum aureum</i> Linton, 1910	Mona Island, 15 April 1975	1/1/6	81611
	* <i>Hamacreadium mutabile</i> Linton, 1910	Mona Island, 15 April 1975	1/1/10	81612
	<i>Opisthadena dimidia</i> Linton, 1910	Mona Island, 15 April 1975	1/1/3	81613
	<i>Stephanostomum</i> sp.	Mona Island, 14 December 1975	1/1/10	81614
Labridae (wrasses)				
<i>Lachnolaimus maximus</i> (Wallbaum) (2/1)	<i>Myzoxenus lachnolaimi</i>	Enrique reef, La Parguera, 30 September 1977	1/1/1	81615
Lutjanidae (snappers)				
<i>Lutjanus apodus</i> (Wal- baum) (4/3)	* <i>Apocreadium foliatum</i>	Mona Island, 15 April 1975	1/1/1	81616
	<i>Hamacreadium mutabile</i>	Mona Island, 15 April 1975	1/1/3	81617
	* <i>Lepidapedon holocentri</i> Sid- diqi and Cable, 1960	La Parguera, 5 May 1977	1/1/1	81618
	* <i>Lurodera decora</i>	Mona Island, 15 April 1977	1/1/1	81619
	<i>Metadena adglobosa</i> Manter, 1947	La Parguera, 19 February 1975	1/1/1	81620
<i>Lutjanus griseus</i> (Lin- naeus) (5/4)	<i>Helicometra (Metahelicome- tra) torta</i> Linton, 1910	La Parguera, 26 July 1990	2/1/1	81621
	* <i>Lepocreadium trulla</i> (Lin- ton, 1907)	La Parguera, 4 December 1978	1/1/1	81622
	<i>Metadena adglobosa</i>	La Parguera, 9 March 1976	1/1/2	81623
<i>Lutjanus jocu</i> (Schnei- der) (1/1)	<i>Hamacreadium</i> sp.	Mona Island, 13 April 1975	1/1/10	81624
<i>Ocyurus chrysurus</i> (Bloch) (3/2)	* <i>Hamacreadium mutabile</i>	La Parguera, 19 February 1975	1/1/7	81625
	* <i>Siphoderina brotulae</i> Man- ter, 1934	Isla Guayacan, La Parguera, 5 March 1975	1/1/8	81626
Mullidae (goatfishes)				
<i>Mulloidichthys martinicus</i> (Cuvier) (1/1)	<i>Opecoeloides vitellosus</i> (Lin- ton, 1900)	La Parguera, 9 September 1984	1/1/4	81627
<i>Pseudupeneus maculatus</i> (Bloch) (2/2)	<i>Helicometra</i> sp.	La Parguera, 7 September 1977	1/1/1	81628
	<i>Helicometra (Metahelicome- tra) torta</i>	Enrique reef, La Parguera, 23 July 1990	1/1/2	81629
	<i>Opecoeloides brachyteleus</i> Manter, 1947	Enrique reef, La Parguera, 23 July 1990	1/1/2	81630
Muraenidae (morays)				
<i>Gymnothorax funebris</i> Ranzani (2/2)	<i>Dollfustrema</i> sp.	La Parguera, 19 February 1975	1/1/4	81631
	<i>Sterrus</i> sp.	Desecheo Island, 28 February 1975	1/1/50	81632
<i>Gymnothorax moringa</i> (Cuvier) (3/2)	* <i>Dictysarca virens</i> Linton, 1910	La Parguera, 6 May 1977	1/1/2	81633
	* <i>Dinurus tornatus</i>	La Parguera, 23 November 1974	1/1/1	81634
	<i>Lecithochirium fusiforme</i> Lühe, 1901	La Parguera, 6 May 1977	1/1/2	81635

Table 1. Continued.

Host (no. examined/ no. infected)	Parasite	Locality, date	No. hosts ex- amined/no. in- fected/avg. no. worms per in- fected host	USNM Helm. Coll. No.
<i>Gymnothorax vicinus</i> (Castelnau) (1/1)	* <i>Brachyphallus parvus</i>	La Parguera, 19 February 1975	1/1/5	81636
	* <i>Lecithochirium fusiforme</i>	La Parguera, 19 February 1975	1/1/3	81637
Ostraciidae (boxfishes)				
<i>Lactophrys bicaudalis</i> (Linnaeus) (1/1)	<i>Pseudocreadium</i> sp.	Sardinero Playa, Mona Is- land, 15 April 1975	1/1/2	81638
Pomacanthidae (angelfish- es)				
<i>Pomacanthus arcuatus</i> (Linnaeus) (5/5)	<i>Antorchis urna</i> (Linton, 1910)	La Parguera, 23 April 1976	2/2/4	81639
	<i>Barisomum candidulum</i> (Lin- ton 1910)	Mona Island, 23 April 1976	3/3/2	81640
Priacanthidae (bigeyes)				
<i>Priacanthus arenatus</i> Cuvier (2/1)	* <i>Tergestia laticollis</i> (Rudol- phi, 1819)	La Parguera, 1 October 1984	1/1/3	81641
Sciaenidae (drums)				
<i>Odontoscion dentex</i> (Cu- vier) (1/1)	<i>Manteriella crassa</i> (Manter, 1947)	Enrique reef, La Parguera, 7 February 1975	1/1/1	
Scombridae (mackerels)				
<i>Scomberomorus regalis</i> (Bloch) (1/1)	* <i>Rhipidocotyle adbaculum</i> Manter, 1940	La Parguera, 22 October 1977	1/1/4	81642
Serranidae (sea basses)				
<i>Epinephelus adscen- sionis</i> (Osbeck) (1/1)	* <i>Myzoxenus lacknolaimi</i>	Mona Island, 13 April 1975	1/1/2	81643
<i>Epinephelus cruentatus</i> (Lacepède) (1/1)	* <i>Cainocreadium lintoni</i>	Ensenada de Guanica, 14 Oc- tober 1977	1/1/1	81644
<i>Epinephelus fulvus</i> (Lin- naeus) (3/3)	* <i>Hamacreadium mutabile</i>	Mona Island, 12 April 1975	2/2/2	81645
	<i>Pseudoplagioporus brevivitel- lus</i>	Mona Island, 14 April 1975	1/1/1	81646
<i>Epinephelus striatus</i> (Bloch) (6/5)	<i>Canocreadium lintoni</i>	Mona Island, 23 April 1976	1/1/2	81647
	* <i>Hamacreadium mutabile</i>	Mona Island, 12 April 1975 Mona Island, 15 April 1975 Mona Island, 23 April 1976	3/2/3 1/1/6 1/1/2	81648
	<i>Hamacreadium</i> sp.	San Cristobal reef, La Par- guera, 27 January 1976	1/1/1	81649
<i>Mycteroperca tigris</i> (Va- lenciennes) (1/1)	<i>Opechona</i> sp.	Mona Island, 14 April 1975	1/1/4	81650
	* <i>Prosorhynchus atlanticus</i> Manter, 1940	Mona Island, 14 April 1975	1/1/4	81651
<i>Mycteroperca venosa</i> (Linnaeus) (4/1)	* <i>Helicometra mirzai</i> Siddiqi and Cable, 1960	Mona Island, 15 April 1975	1/1/9	81652
Sparidae (porgies)				
<i>Calamus calamus</i> (Va- lenciennes) (1/1)	* <i>Pycnadena lata</i> (Linton, 1910)	La Parguera, 15 January 1978	1/1/1	81653
Sphyraenidae (barracudas)				
<i>Sphyraena barracuda</i> (Walbaum) (1/1)	<i>Sterrus</i> sp.	La Parguera, 4 March 1975	1/1/6	81654
Synodontidae (lizardfishes)				
<i>Synodus intermedius</i> (Agassiz) (7/4)	<i>Dichadena</i> sp.	La Parguera, 10 February 1976	1/1/4	81655
	<i>Lecithochirium microcerus</i>	La Parguera, 23 July 1990 La Parguera, 26 July 1990	1/1/12 4/1/2	81656
	* <i>Myosaccium opisthonemae</i> (Siddiqi and Cable, 1960)	La Parguera, 8 February 1977	1/1/3	81657

tected in specimens of *H. foliatum* from *Haemulon aurolineatum* (Cuvier), *Haemulon carbonarium* (Poey), and *Haemulon parrai* (Desmarest) from Biscayne Bay, Florida, prompted Overstreet (1969) to transfer this species to the genus *Apocreadium*.

Homalometron dowgialloi may be readily distinguished from other members of the genus in that it possesses a lobed ovary and vitellaria commencing at the equatorial level of the acetabulum. Our form appears closest to *H. caballeroi* from *Balistes polylepis* (Steindachner) from Bahia Kino, Sonora, Gulf of California, and *H. armatum* from *Aplodinotus grunniens* from Lake Erie. *Homalometron dowgialloi* differs from *H. caballeroi* in having a prepharynx shorter than the pharynx rather than a prepharynx about the same length as the pharynx, a proportionally shorter rather than a proportionally longer post-testicular space, noncontiguous rather than contiguous testes, and shorter eggs (44–52 rather than 76–84 μm long). *Homalometron dowgialloi* differs from *H. armatum* in being smaller (0.86–1.82 rather than 1.74–3.44 mm long), in having a larger sucker width ratio (1:1.9–2.0 rather than 1:1.2–1.4), and shorter eggs (44–52 rather than 71–115 μm long).

Results

At least 1 trematode was detected in 303 (87.8%) of 345 fishes examined. Forty-five species were identified, including 1 new species; 14 others were identified to genus only. Of the 44 species of fishes that were infected, 20 (45.5%) harbored 1 species of digenean; 9 species (20%) 2; 6 species (13.6%) 3; 1 species (2.3%) 4; 1 species 5; and 1 species 11.

Thirty-one (68.9%) of the 45 species of digeneans occurred in 1 host species; 7 (15.6%) in 2; 2 (4.4%) in 3; 2 in 4; 2 in 5; and 1 (2.2%) in 7.

The intensity of a given species of digenean ranged from 1 to 15 specimens per host. Each of 31 fishes yielded 1 specimen of a given species; 96, 2; 99, 3; 26, 4; 148, 5; 64, 6; 2, 7; 167, 8; 1, 9; 2, 10; and 1, 15.

Because only a few specimens of most hosts were available for study, prevalence of their digeneans could not be ascertained. However, of 210 French grunts, *Haemulon flavolineatum* Desmarest, taken at La Parguera between 15 October 1976 and 15 October 1977, 65.7% were infected with *Leurodera decora* Linton, 1910, 51.9% with *Apodocotyle oscitans* (Linton, 1910), 42.9% with *Apocreadium foliatum* (Siddiqi and Cable, 1960), 36.2% with *Diplangus*

paxillus Linton, 1910, 28.1% with *Infundibulosotomum spinatum* Siddiqi and Cable, 1959, 25.7% with *Postmonorchis orthopristsis* Hopkins, 1941, 0.9% with *Stephanostomum sentum* (Linton, 1910), and 0.5% with *Brachyphallus parvus*.

Two of 43 digenean species are reported from Puerto Rico for the first time, namely, *Horatrema crassum* Manter, 1947, and *Derogenes crassus* Manter, 1934. Forty-one new host records are reported as indicated by an asterisk (*) preceding the parasite name (Table 1).

Discussion

Three studies of the digeneans of marine fishes from the western and southwestern coasts of Puerto Rico have now been completed. Siddiqi and Cable (1960) found 76 species of fishes harboring digeneans, 42 were infected with only 1 species (55.2%), 12 with 2 (15.8%), 9 with 3 (11.8%), 5 with 4 (6.6%), 3 with 5 (3.9%), 3 with 6, 1 with 7 (1.3%), and 1 with 9. Dyer et al. (1985) reported 70 species of fishes infected, 56 harbored 1 species (80%) of digenean, 8 species 2 (11.4%), and 2 species with 3 to a maximum of 5 (2.9%). These findings concur with those in the present study in that the majority of infections encountered constituted single infections and that the number of hosts with mixed infections decreased as the variety of digeneans increased.

Calculated from the data presented by Siddiqi and Cable (1960), 90 (73.2%) of the 123 species of digeneans found occurred in only 1 host species, 28 (22.8%) in 2 host species, 3 (3.4%) in 3, and 2 (1.6%) in 4. Dyer et al. (1985) reported that 52 (78.8%) of the 66 species of digeneans occurred in 1 host species, 10 (15.2%) in 2 host species, and the remaining 4 (6%) in 3, 5, 6, and 8 host species, respectively.

The intensity for each species of digenean could not be ascertained from the data presented by Siddiqi and Cable (1960). The intensity of a given species as reported by Dyer et al. (1985) ranged from 1 to 100 per host. Each of 88 fishes yielded 1–5 specimens; 18, 6–10; 4, 11–15; 3, 20; 5, 21–25; 3, 30–35; 3, 50; and 4 yielded 58, 76, 90, and 100 specimens, respectively. Comparison of these findings with those reported for the present study reveal that most of the fishes are infected with between 1 and 5 individuals of a given species of digenean.

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Literature Cited

- Cable, R. M.** 1954a. Studies on the marine digenetic trematodes of Puerto Rico. The life cycle in the family Haplosporididae. *Journal of Parasitology* 40:71-76.
- . 1954b. Studies on the marine digenetic trematodes of Puerto Rico. The life cycle in the family Megaperidae. *Journal of Parasitology* 40:202-208.
- . 1956a. *Opistholebes diodontis* n. sp. Its development in the final host, the affinities of some amphistomatous trematodes from marine fishes and the allocreadiid problems. *Parasitology* 46: 1-13.
- . 1956b. Marine cercariae of Puerto Rico. *New York Academy of Sciences* 16:491-577.
- Dyer, W. G., E. H. Williams, Jr., and L. Bunkley-Williams.** 1985. Digenetic trematodes of marine fishes of the western and southwestern coasts of Puerto Rico. *Proceedings of the Helminthological Society of Washington* 52:85-94.
- Le Zotte, L. A., Jr.** 1954. Studies on marine digenetic trematodes of Puerto Rico: the family Bivesiculidae, its biology and affinities. *Journal of Parasitology* 40:148-162.
- Miller, G. C.** 1959. Studies on the genus *Homalometron* Stafford, 1904 (Lepocreadiidae) with a re-description of *H. armatum* (MacCallum, 1895). *Journal of Parasitology* 45:539-542.
- Overstreet, R. M.** 1969. Digenetic trematodes of marine teleost fishes from Biscayne Bay, Florida. *Tulane Studies in Zoology and Botany* 15:119-176.
- Siddiqi, A. H., and R. M. Cable.** 1960. Digenetic trematodes of marine fishes of Puerto Rico. *New York Academy of Sciences* 17:257-369.
- Yamaguti, S.** 1971. *Synopsis of Digenetic Trematodes of Vertebrates*. Keigaku Publishing Co., Tokyo, Japan. 1,074 pp.

Meeting Schedule

HELMINTHOLOGICAL SOCIETY OF WASHINGTON 1992-1993

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|-------------------|--|
| Oct 1992 | Anniversary Dinner Meeting with the Trustees of the Brayton H. Ransom Memorial Trust Fund. Date to be announced later |
| (Wed) 4 Nov 92 | "To Be Announced," Animal Parasitology Unit, U.S. Department of Agriculture, Beltsville, MD |
| (Wed) 16 Dec 1992 | "To Be Announced," Plant Protection Institute, U.S. Department of Agriculture, Beltsville, MD |
| (Wed) 13 Jan 1993 | "To Be Announced," Division of Experimental Therapeutics, Walter Reed Army Institute of Research, Washington, DC |
| (Wed) 10 Feb 1993 | "To Be Announced," U.S. Naval Medical Research Institute, Bethesda, MD |
| (Wed) 10 Mar 1993 | "To Be Announced," Laboratory of Parasitic Diseases, National Institutes of Health, Bethesda, MD |
| Apr 1993 | Date, place, and topic to be announced later |
| (Sat) 1 May 1993 | "Vertical Transmission of Parasites," Annual Joint Meeting with the New Jersey Society for Parasitology, to be held at the New Bolton Center, University of Pennsylvania, Kennett Square, PA |