Helminths of Striped Bass (Morone saxatilis) from the Kouchibouguac River, New Brunswick

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TABLE 1. Dimensions of third-stage larvae of *Elaeophora schneideri* from *Tabanus lineola hinellus* collected on South Island, Georgetown County, South Carolina. Except as noted, measurements of males and females are combined.[a]

Parameter	Number examined	Measurements (microns)	
		Average	Range
Body length	19	3,731	3,250–4,023
Body width	17	48	39–57
Esophagus length			
Muscular	13	253	221–277
Glandular	9	1,617	1,333–1,896
Nerve ring[b]	12	121	97–135
Genital primordium[b]			
Female	3	324	297–358
Male	4	1,983	1,814–2,053
Anus[c]	21	54	42–63

[a] Measurements were made on three female larvae, four male larvae, and 16 larvae of undetermined sex.
[b] Distance from anterior end of body.
[c] Distance from posterior end of body.

tralateral carotid artery. Forehead skin was negative for microfilariae. Microfilariae were obtained from forehead skin of two fawns inoculated with 48 and 72 third-stage larvae, respectively. Control animals were not infected with *E. schneideri*.

This is the first report of *E. schneideri* in tabanids in the southeastern United States. Recovery of adults and microfilariae of *E. schneideri* following inoculation of white-tailed deer fawns with third-stage larvae obtained from *T. l. hinellus* established this horsefly as a biological intermediate host of *Elaeophora* on South Island. Observations by two authors of this paper (CEC and VFN) of *T. l. hinellus* feeding on the dorso-facial region of captive white-tailed deer on South Island and a previous report of *T. l. hinellus* feeding on deer in coastal Louisiana (Wilson et al., 1969, Ann. Entomol. Soc. Am. 62: 1043–1046) further establish this horsefly as a pest of white-tailed deer. *Tabanus nigrovittatus* seems to be less important in the transmission of *Elaeophora*. Based on the literature and the findings of this study, *E. schneideri* will develop in a number of tabanids. Further research is indicated in enzootic areas, viz., Florida, Georgia, and South Carolina, to relate these findings to the epizootiology of elaeophorosis in the southeastern United States.

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During an anadromous fish population survey in the Kouchibouguac River, New Brunswick, in September and October of 1979, 17 striped bass were examined for metazoan parasites. The fish (36.5–50.1 cm fork length; 2–6 yr old) were angled or

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TABLE 1. Prevalence and intensity of helminths of 17 striped bass from the Kouchibouguac River, New Brunswick.

Species	Site of infection	Prevalence[a]	Intensity[b]	
			Mean	Range
Trematoda				
Homalometron pallidum	stomach	58.8	2.5	1–7
Lepocreadium setiferoides	intestine	52.9	3.0	1–9
Stephanostomum tenue	intestine	41.0	2.7	1–6
Acanthocephala				
Echinorhynchus gadi	intestine	35.2	5.6	2–9
Neoechinorhynchus rutili	intestine	70.5	7.2	1–13
Nematoda				
Philometra rubra	body cavity, peritoneum	82.3	21.8	13–36

[a] Percent infected.
[b] Number of parasites per infected fish.

caught in gill nets and frozen whole within 1 hr of capture. Eleven fish were males, six were females.

Examination for helminth parasites was performed in the laboratory as follows: Gastrointestinal tracts were removed from the body cavity and then separated into individual organs (stomach, pyloric cecae and intestine). Each organ was incised upon its entire length and the contents washed through fine mesh sieves. The collected contents were then resuspended in water in dishes and examined under a low-power (10×) dissecting microscope. The body cavity and peritoneum were rinsed as above, and examined visually for parasites.

Parasites recovered were fixed in 70% ethanol. Digenea and Acanthocephala were stained in Grenachers' alum carmine or Blachins' lactic acid carmine. Nematodes were cleared in a 1:9 solution of glycerin and 70% ethanol or 85% lactic acid.

A list of the parasites recovered from the striped bass is presented in Table 1. Of the six species recovered during the present survey, three, *Lepocreadium setiferoides*, *Stephanostomum tenue*, and *Philometra rubra*, have been found in striped bass from the Chesapeake Bay by Paperna and Zwerner (1976, J. Fish. Biol. 9: 267–287), but have not been reported from striped bass, or any other fish, in Canadian waters. Linton (1901, Bull. U.S. Fish. Comm. 19: 405–492) reported *Echinorhynchus gadi* from striped bass collected in the Gulf of Maine. The remaining species, *Homalometron pallidum* and *Neoechinorhynchus rutili*, have not previously been reported from striped bass, and are new host records.

The observed parasite fauna reflects the anadromous habits of striped bass in the Kouchibouguac River. Three of the species of helminths (i.e., *H. pallidum*, *N. rutili* and *P. rubra*) are of freshwater origin (Yamaguti, 1959, Systema Helminthum, Vol. III, The Nematoda. Interscience Publ., New York, 1032 pp.; Margolis and Arthur, 1979, Bull. Fish. Res. Board Can. 199: 68, 119) and *L. setiferoides*, *S. tenue* and *E. gadi* are of marine origin (Yamaguti, 1958, Systema Helminthum. Vol. I. Digenetic Trematodes. Interscience Publ., New York, 900 pp.; Margolis and Arthur, 1979, op. cit.).

Representative specimens of each species have been deposited in the National Museum of Natural History, Otta-

wa. Catalogue numbers are as follows: *Homalometron pallidum*, Stafford 1904, 0380; *Lepocreadium setiferoides*, Miller et Northrup 1926, 0378; *Stephanostomum tenue*, Martin 1938, 0381; *Enchinorhynchus gadi*, Zoega in Müller 1776, 0377; *Neoechinorhynchus rutili*, Müller 1780, 0382; *Philometra rubra*, Leidy 1856, 0379.

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Hatschekia oblonga (Copepoda, Caligoida) from Yellowtail Snapper (*Ocyurus chrysurus*) in the Florida Keys

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Ocyurus chrysurus (yellowtail snapper), one of the most common and noticeable species of reef-associated fishes in the Caribbean, was collected with hook and line from 0100 to 0430 hr on 3 October 1982 just north of the Marquesas Keys (24°32.67′N, 82°08.11′W) in about 6 m of water. The fish were placed on ice for approximately 6 hr. Sex and standard length were recorded, and the body surface, fins, mouth, and opercles of each fish were examined. The gill arches were preserved in 70% ethanol and later examined with the aid of a dissecting microscope.

Of the 23 yellowtail snapper collected, 10 were female and 13 male, and they ranged in standard length from 18.1 to 27.2 cm. No parasites were present at any site except the gills, and only one species was found there. This was a copepod identified as *Hatschekia oblonga* (verified by Ju-shey Ho, California State Univ. at Long Beach), and representative specimens were deposited in the U.S. National Museum (USNM 204590). Prevalence was 78.2%, intensity varied from 1 to 31 with a mean of 6.04, and no gross pathological effects were apparent. Omitting the three cases where from one to three individuals were unattached in the bottles when gills were examined, there was a significant ($P < 0.05$; Spearman Rank Correlation) relation between arch number and intensity with intensity decreasing from anterior to posterior arches and a significant ($P < 0.05$; Chi-square test) preference for the medial hemibranchs. Fifty-two individuals were removed from left gill arches and 76 from right arches, which is significantly different from expected ($P < 0.05$; Chi-square test). There was no significant correlation of intensity with fish length.

Apparently the only report of a species of the genus *Hatschekia* (*H. albirubra*) from yellowtail snapper was by Wilson (1913, Proc. U.S. Nat. Mus. 44: 1189–1272). Pearse (1951, Proc. U.S. Nat. Mus. 101: 341–372) reported *H. oblonga* from mangrove snapper (*Lutjanus griseus*) and schoolmaster (*L. apodus*) at Bimini, Bahamas, but apparently did not examine any *Ocyurus chrysurus*. Thus, this report probably constitutes a new host record for *H. oblonga*.

Fernando and Hanek (1976, *In* Ecological Aspects of Parasitology, Kennedy (ed.), North-Holland Publ. Co., Amsterdam, pp. 209–226) suggested that the means by which copepod parasites attach to their hosts, especially the extent to which they are able to change sites, is an important factor in their dispersion patterns. How-

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