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A Preliminary Report on the Incidence of Lymphocystis Disease in the Fish of the Sapelo Island, Georgia, Area

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Introduction

The observations reported here are a part of a year long survey of diseases of estuarine and near shore fishes being conducted in the Sapelo Island, Georgia, area. This area is located near the middle of the Georgia coast and about five miles to the north of the mouth of the Altamaha River. A variety of diseases and parasitic infections have been found so far, but it appears lymphocystis disease will be one of the most interesting of these problems to study.

Lymphocystis disease is a viral disease that affects both marine and fresh-water fish during the warm months of the year.[7] It is caused by a DNA virus[9] that infects the connective tissue cells of the spleen, ovary, gut wall or the skin of the fish.[5,7] The principal effect on these fibroblasts is to cause extreme hypertrophy and the secretion of a hyaline membrane around the infected cells.[1,4,5,6] These greatly enlarged fibroblasts, singly or in tumorous masses, are often macroscopic and constitute the usual means of detecting the disease in infected fish. The virus particles appear in the cytoplasm and escape when the hyaline capsule is ruptured[4,6] or the fish dies and decomposes.[7]

Much of the information known about this disease is summarized by Weisenberg (1965).[8]

Materials and Methods

Fish for this survey were collected by the use of a ten foot Otter trawl in the Duplin River once a week and by cast net, beach seine and hook-and-line fishing at other locations around the island. All fish were preserved in 10 per cent neutral formalin and given a post mortem examination when returned to the laboratory. An illuminated five inch magnifier was used for the examination and a dissecting microscope when needed. Tissues for histological preparation were removed from observed lesions. The tissues were embedded in Paraplast[1] and sectioned at eight microns. Haematoxylin - Eosin was used for routine staining.[8]

Results

From Table 1 it can be seen that all cases of lymphocystis disease observed during the first four months of the survey were found in *Stellifer lanceolatus* or *Cynoscion regalis*. In October, 1154 fish were examined. Of these, 575 were *S. lanceolatus*. Eight cases of lymphocystis disease were found in *S. lanceolatus*. This

[1] Fisher Scientific Co., Pittsburgh, Pennsylvania.

indicates an infection rate of about 1.5%. Two of these cases were visceral infections and the other six were cutaneous infections.

There were fifty *C. regalis* examined in October and one of these had a cutaneous infection of lymphocystis disease; an infection rate of 2%.

In November, 1192 fish were examined. Of these, 793 were *S. lanceolatus.* Three cases of cutaneous lymphocystis disease were found, indicating an infection rate of about 1.5%. One case of cutaneous lymphocystis disease in the 22 *C. regalis* examined in November indicates an infection rate of about 4.5%.

There were no cases of lymphocystis disease observed in December or January, although 610 and 1252 fish were examined in those months, respectively. In December, 365 *S. lanceolatus* and 6 *C. regalis* were examined. In January 615 and 5 specimens of these fish were examined.

TABLE 1. *Incidence of lymphocystis disease near Sapelo Island, Georgia.*

Month and Total Fish	Case Number	Genus and Species	Incidence *Stellifer*	Incidence *Cynoscion*
October 1154	003	S. lanceolatus		
	014	S. lanceolatus		
	016	S. lanceolatus		
	030	S. lanceolatus		
	045	S. lanceolatus		
	046	S. lanceolatus		
	057	C. regalis		
	059	S. lanceolatus		
	060	S. lanceolatus		
			8/575 = 1.4%	1/50 = 2%
November 1192	090	S. lanceolatus		
	092	S. lanceolatus		
	112	C. regalis		
	119	S. lanceolatus		
			3/793 = 0.4%	1/22 = 4.6%
December 610			0/364	0/6
January 1252			0/615	0/5

Discussion

Lymphocystis disease has not been reported in the two species of fish which it infects in the Sapelo Island area. Both of these fish are members of the family Sciaenidae and one, *Cynoscion,* is an economically important fish. The cases reported here have all been taken in the Duplin River, a river draining the marshes along Sapelo Island and connecting with Doboy Sound to the south. This does not necessarily mean that the disease is confined to this one river. It will be necessary to sample more extensively to determine the distribution of infected fish.

From Table 1, it will be noted that the disease was not found in December and January when the water temperature was lower. Enough *Stellifer* and *Cynoscion* were caught during these months to make detection of the disease likely if it was present. The disappearance of the visible

lesions during the colder months has been reported before[5] and my observations support this. Whether it is water temperature acting along or in conjunction with salinity, photoperiod, dissolved nutrients, planktonic organisms, etc., is yet to be determined. The fish may be more resistant to infection at lower temperatures, or the virus may be less infective.

Templeman[7] considers lymphocystis disease to be "usually not fatal." I have not found any fish in my samples that appeared to have died of the disease, but several of the heavily infected individuals must have been impaired by the presence of the tumorous masses. This probably increases the susceptibility of these fish to predation.

The lesions found on *Cynoscion* were milder than on *Stellifer* but would have been sufficient to keep the fish out of the food market. The incidence of this disease in market fish should be studied even though the disease apparently presents no danger to the human consumer.[7]

It has been indicated in the literature that infection with the lymphocystis virus takes place through the gills or by entering the fish through breaks in the skin.[7] Ectoparasites have been cited as vectors.[7] There is no indication in this survey what the means of infection in *Stellifer* and *Cynoscion* may be. Both fish are abundant and both fish have been caught with surface abrasions evident. Ectoparasites are found on both fish. *Cynoscion* is a carnivore and *Stellifer* is a filter feeder.[2] The visceral infections in *Stellifer* may be associated with the ingestion of planktonic organisms carrying the virus or may be the result of viremic transfer.

This summer, studies will be started on the manner of spread of the disease in the two populations of fish in the Sapelo Island area. Additional studies will be started on the species specificity of the virus.

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