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Source: Journal of Wildlife Diseases, 13(3) : 307-312

Published By: Wildlife Disease Association

URL: https://doi.org/10.7589/0090-3558-13.3.307

Dascyllus SPP.: NEW HOSTS FOR LYMPHOCYSTIS, AND A LIST OF RECENT HOSTS

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Abstract: Lymphocystis disease is reported for the first time from the white-tailed damselfish, *Dascyllus aruanus*, and the black-tailed humbug, *Dascyllus melanurus*. Both species are commercially important exotic aquarium fish from the Indo-Australian Pacific. Lymphocystis is recorded again from the copper banded angelfish, *Chelmon rostratus*. An updated host list for the disease is included.

INTRODUCTION

Lymphocystis is an infectious viral disease of freshwater and marine teleosts. The virus causes hypertrophy of connective tissue cells resulting in macroscopic nodules often located on the fins and skin. Lymphocystis disease usually is non-fatal, and the nodules eventually disappear; there is no known treatment. Many additional fishes have been reported with lymphocystis (Table 1) since the summary by Nigrelli and Ruggieri.[21] To present, lymphocystis infects 96 species of fish belonging to 32 families and 6 orders. The unconfirmed observation by Dawson[9] would add one species, one family, and one order to the list.

CASE REPORTS

1. *Dascyllus aruanus* (Linnaeus), white-tailed damselfish

Lymphocystis has been observed routinely on this fish, imported from the Philippines through California, for the past two years. Two individuals were placed in a 300 l tank at GCRL on 14 August 1976. The tank was already occupied by three clown anemone, *Amphiprion ocellaris*, one high-hat, *Equetus acuminatus*, and three peppermint shrimp, *Lysmata wurdemanni;* none of the fish showed any evidence of lymphocystis.

The two fish were moved to a 20 l tank (A) and five additional specimens were obtained from the same sources on 29 August 1976 and placed in another 20 l tank (B). One of the five (TL = 47 mm) had a lymphocystis infection. Microscopic examination revealed nodules on all the fins, on top of the head, and on both sides of the body. No nodules were found on the gills or eyes, or internally. Viral particles were confirmed by electron microscope studies (Harold D. Howse, GCRL, personal communication). No parasitic dinoflagellates, *Amyloodinium ocellatum* (Brown), were found on the gills or skin; no internal parasites were found (Ronnie Palmer, GCRL, personal communication).

The two fish in tank A (34 ppt) and the four remaining in tank B (30 ppt) were anesthetized with MS-222,[1] examined for lymphocystis nodules (none found), and injected on both sides of the body plus the bases of the dorsal, anal, and caudal fins with fresh tissue obtained from the fish infected with lymphocystis.

[1] Tricaine methanesulfonate, Crescent Research Chemicals Inc., Scottsdale, Arizona.

TABLE 1. Lymphocystis-infected fish reported since Nigrelli and Ruggieri:[21] Spontaneous (S), aquarium (A), experimental (E), and tissue culture (TC) infections.

Host	Type of infection	Authority
CLUPEIFORMES		
CLUPEIDAE		
Clupea harengus var. *membras* Linnaeus	S	1
LOPHIIFORMES		
OGCOCEPHALIDAE		
Ogcocephalus nasutus (Valenciennes)	?	8
GADIFORMES		
OPHIDIIDAE		
Gunterichthys longipenis Dawson	S	6*
PERCIFORMES		
CENTROPOMIDAE		
Centropomus undecimalis (Bloch	S	9
SERRANIDAE		
Doderleina berycoides Hilgendorf	?	8
LUTJANIDAE		
Lutjanus griseus (Linnaeus)	S	16
SPARIDAE		
Archosargus probatocephalus (Walbaum)	S	23
SCIAENIDAE		
Bairdiella chrysura (Lacépède)	S	7, 13, 14, 15, 27
	E	15
	TC	27, 28
Cynoscion arenarius Ginsburg	S	4, 7, 10, 13
	E	5
Cynoscion nothus (Holbrook)	S	25
Cynoscion regalis (Bloch & Schneider)	S	24, 25
Larimus fasciatus (Holbrook)	E	14, 15
Micropogon undulatus (Linnaeus)	S	4, 5, 10
	E	5, 11
Pogonias cromis (Linnaeus)	E	5
Stellifer lanceolatus (Holbrook)	S	24, 25
CHAETODONTIDAE		
Chaetodon auriga Forskal	A	18
Chaetodon lunulatus Quoy & Gaimard	A	18
Chaetodon miliaris Quoy & Gaimard	A	18
Chelmon rostratus (Linnaeus)	A	18, present report
Pomacanthus annularis (Bloch)	A	18

TABLE 1—continued

Host	Type of infection	Authority
CICHLIDAE		
Apistogramma ramirezi Myers & Harry	?	8
Haplochromis sp.	S	22
Haplochromas elegans	S	22
Pterophyllum scalare (Lichenstein)	?	8
Tilapia amphimelas	S	22
Tilapia esculenta	S	22
Tilapia variabilis	S	22
POMACENTRIDAE		
Dascyllus aruanus (Linnaeus)	A	present report
Dascyllus melanurus Bleeker	A	present report
GRAMMIDAE		
Gramma loreto Poey	A	12
LABRIDAE		
Bodianus mesothorax (Schneider)	A	18
CLINIDAE		
Acanthemblemaria crockeri Beebe & Tee-Van	S	17
BLENNIIDAE		
Hypsoblennius gilberti (Jordan)	A	17
GOBIIDAE		
Gillichthys seta (Ginsburg)	S	19
Gobiosoma paradoxum (Gilbert)	S	19
SCORPAENIDAE		
Sebastes constellatus (Jordan & Gilbert)	A	18
Sebastes maliger (Jordan & Gilbert)	A	18
Sebastes nebulosus Ayres	A	18
SIGANIDAE		
Lo vulpinus (Schlegel & Müller)	A	12, pers. comm.
PLEURONECTIFORMES		
BOTHIDAE		
Paralichthys dentatus (Linnaeus)	A	26, pers. comm.
Paralichthys lethostigma Jordan & Gilbert	A	26
PLEURONECTIDAE		
Pseudopleuronectes americanus (Walbaum)	S	20

TABLE 1—continued

Host	Type of infection	Authority
TETRAODONTIFORMES		
DIODONTIDAE		
Diodon holocanthus Linnaeus	S 19	
Diodon hystrix Linnaeus	E 19	

* "...apparently infected with lymphocystis disease" (Dawson,[6] p. 206). Presently unconfirmed.

The four fish in tank B died on 9, 24, and 27 September 1976 from massive ciliate infections; the ciliates provisionally were identified as *Cryptocaryon irritans* Brown. None of these fish showed any signs of lymphocystis; however, large areas of hyperplastic epidermal tissue were associated with the ciliates. By 21 October 1976, the two fish in tank A had not shown signs of lymphocystis.

On 31 October 1976 we obtained another fish which had lymphocystis nodules on the fins and skin. Thus, two of eight fish examined were infected.

2. *Dascyllus melanurus* Bleeker, black-tailed humbug

Lymphocystis also has been observed on this species over the past two years. Two fish were placed in the same 300 l tank as the original two *D. aruanus* on 14 August 1976. Nine days later we observed white-colored lesions on the fins and skin of both fish; lymphocystis was verified microscopically, and viral particles were confirmed by electron microscope studies (Harold D. Howse, GCRL, personal communication).

These two fish were moved to tank A with the two *D. aruanus,* and on 1 September 1976 they were anesthetized with MS-222, and the nodules removed with the aid of forceps and a dissecting microscope. Both fishes (36, 48 mm) had nodules on all fins and on both sides of the body. The fish were not examined internally, but were revived and placed in a 600 l tank for further observation.

On 17 September 1976 one of the two fish from which the nodules were removed was noticed to have more nodules than previously. This infection is presumed to be a continuation of the initial infection, and not a re-infection. On 25 October 1976 this fish had one small lesion on the dorsal fin; the remainder had sloughed. Thus, in this case, the course of the disease in *D. melanurus* was approximately eight weeks.

3. *Chelmon rostratus* (Linnaeus), copper banded angelfish

Six fish received in September 1976 were examined microscopically and lymphocystis nodules were present on the fins and skin of four.

DISCUSSION

The only other cases of lymphocystis in the family Pomacentridae were from the spine-cheeked anemone fish, *Amphiprion* (*Premnas*) *biaculeatus* (Bloch), and the percula anemone fish, *Amphiprion percula* (Lacepede)[3] (probably *A. ocellaris;* see Allen,[1] p. 268). We report two additional hosts from this family. Lymphocystis was previously reported from *Chelmon rostratus*[18] and is recorded again.

Acknowledgments

W. Jeff Tolbert provided some technical assistance.

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Received for publication 1 March 1977