

## Lymphocystis in Indian Glassfish *Chanda ranga* Imported from Thailand to Puerto Rico

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**Abstract.**—Lymphocystis occurred in Indian glassfish *Chanda ranga* imported to Puerto Rico from Thailand. This is only the second report of lymphocystis in Indian glassfish and in the family Chandidae (or Ambassidae), but the disease appears to have become widespread in this species in the ornamental aquarium fish trade throughout the southeastern USA and the Caribbean. We report the first occurrence of Indian glassfish with lymphocystis in a region where the fish can survive in the wild. Lymphocystis is not known in Puerto Rican freshwater fishes, and the introduction of this disease should be avoided.

Lymphocystis disease is caused by a virus that has different strains in freshwater and marine fishes; it has been found in marine fishes in the Caribbean, including Puerto Rico (Williams et al. 1984; Wolf 1988; Bunkley-Williams et al. 1996, this issue). Bunkley-Williams and Williams (1994, 1995) did not find lymphocystis in Puerto Rican freshwater fishes although they examined more than 3,000 specimens, including all freshwater species in Puerto Rico, during a 20-year period. Heckmann and Zhuo (1992) found lymphocystis in Indian glassfish *Chanda ranga* in freshwater aquaria in Utah. Here we report lymphocystis in Indian glassfish brought into Puerto Rico and note that the disease may be carried widely by this species in the ornamental fish trade. Indian glassfish originally ranged from India to Myanmar, but now they are reared in other Asian countries for the international aquarium trade.

### Methods

On 15 March 1993 we observed 100 Indian glassfish that had been held for 2 weeks in an aquarium shop in Mayagüez, Puerto Rico. All of the observed fish were in a single closed-system glass aquarium filled with 100 L freshwater; no

more than 120 fish were held in the aquarium. The fish were fed dry commercial fish food, and the tank had an undergravel filter. The shop had no previous history of lymphocystis in its fish, and no other fish species developed lymphocystis lesions for up to 6 months after the reported infection. The Indian glassfish had been raised in earthen ponds in Thailand (M. Velariote, El Pet Shop, Mayagüez, Puerto Rico, personal communication), but additional information was not available. We visited 28 other aquarium shops in Puerto Rico, Alabama, Georgia, and Florida and also contacted 35 aquarium shops and 15 distributors of ornamental fishes in the southeastern USA and the Caribbean in an attempt to trace the origin of the infected glassfish.

Two clinically infected Indian glassfish, one male and one female (41–44 mm total length), were caught with a net and held alive in a plastic bag of aquarium water until they could be photographed. The fish were then euthanatized with tricaine methanesulfonate and fixed in 10% phosphate-buffered formalin. Lesions were removed and embedded in methacrylate, sectioned, and stained with methylene blue–azure II–basic fuchsin. The lesions were deposited in the Registry of Tumors in Lower Animals (RTLA 5956), George Washington University Medical Center, Washington, D.C., and the fish were deposited in the ichthyological collection of the U.S. National Museum (USNM 330062), Smithsonian Institution, Washington, D.C.

### Results and Discussion

Five of the 100 Indian glassfish examined grossly had external masses as large as 5 mm in diameter. Appearance of the masses indicated lym-

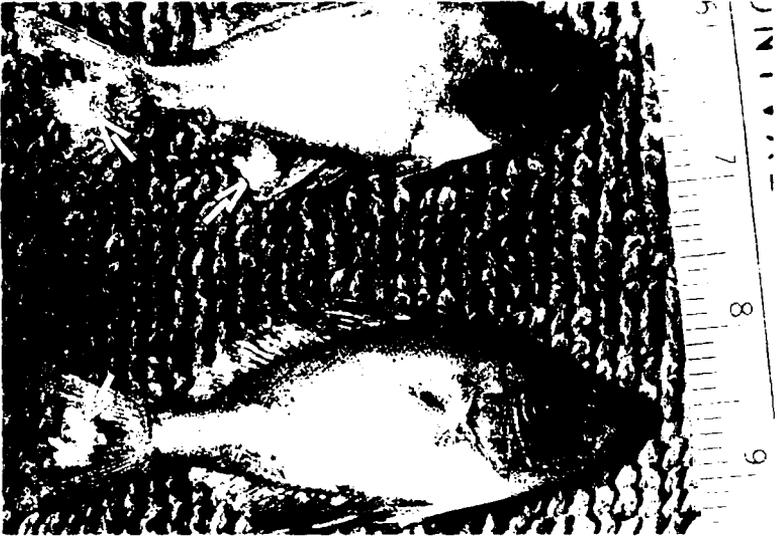


FIGURE 1.—Male (top) and female Indian glassfish with lymphocystis lesions on fins. Arrows denote lesions; rule is in centimeters.

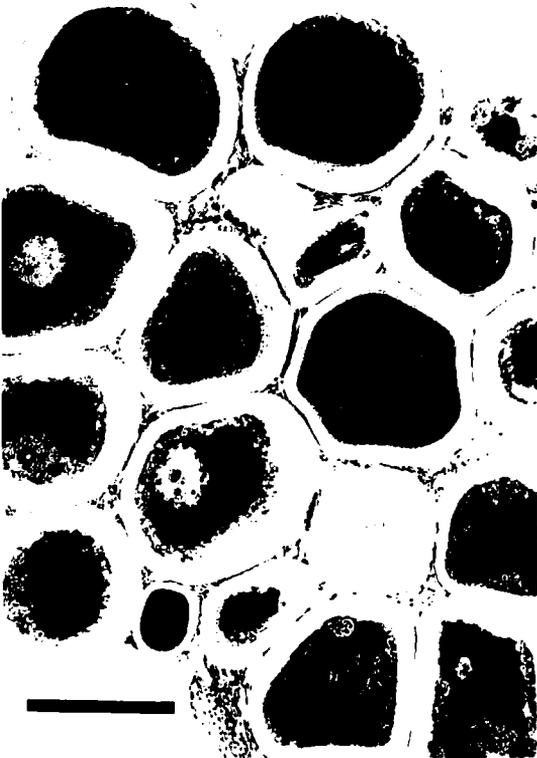


FIGURE 2.—Section of lymphocystis lesion from the fin of an Indian glassfish. Bar = 200  $\mu$ m.

phocystis disease (Figure 1). The male caught for closer examination had lesions characteristic of lymphocystis disease in the caudal and anal fins. The female had similar lesions in the caudal fin and on the trunk, and smaller lesions were in the dorsal fins (Figure 1).

Histologic examination revealed that the lesions were located in the dermis and consisted of enlarged cells with a maximum diameter of 400  $\mu$ m (Figure 2). Each hypertrophied cell was encased in a hyaline capsule and had an enlarged nucleus and basophilic, cytoplasmic inclusions. These histological features are characteristic of lymphocystis.

We observed gross lesions in specimens of Indian glassfish in a pet shop in Anniston, Alabama (21 December 1994), that appeared to be similar to the reported case in Puerto Rico. Unfortunately, samples could not be obtained.

We contacted personnel at 63 pet shops and 15 distributors in all states of the southeastern USA, Puerto Rico, and the U.S. Virgin Islands but were not able to determine which production facilities originated the shipments with infected fish. Most (56 of 63) pet shop owners and all distributors had seen what they considered to be lymphocystis disease in Indian glassfish.

This is the second report of lymphocystis in Indian glassfish (Heckmann and Zhuo 1992), but it is the first report of the disease occurring in a region where Indian glassfish can survive in the

wild. Nelson (1994) placed *Chanda* and some closely related genera in the family Chandidae and considered Ambassidae as a synonym. Chandids sometimes have been included in the family Centropomidae, but they are not closely related to this family (Greenwood 1976). The affinity of Chandidae to other Percoidei is uncertain. Lymphocystis has been reported in common snook *Centropomus undecimalis*, a member of the family Centropomidae (Howse 1972).

Bunkley-Williams and Williams (1994, 1995) did not find lymphocystis in freshwater fishes in Puerto Rico. The lymphocystis in Puerto Rican marine fishes may represent a different strain of virus that does not infect freshwater fishes (Williams et al. 1984; Wolf 1988). Bunkley-Williams and Williams (1994, 1995) noted the possibility of introducing parasites to Puerto Rico by way of aquarium fishes. Introduction of this exotic virus would also be unfortunate.

#### Acknowledgments

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