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Nematode-Induced Abdominal Distention in the Hawaiian Puffer Fish, *Canthigaster jactator* (Jenkins)[1]

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ABSTRACT: A heavy infection in the body cavity of two sharp-nosed puffer fish, *Canthigaster jactator*, by a nematode, *Philometra* sp., is reported. The large number and size of the nematodes caused a conspicuous protrusion of the abdomen in both fish. Other infected specimens of *C. jactator* were observed in the waters of Kaneohe Bay, Oahu, Hawaii.

AN INFECTION in the body cavity of two sharp-nosed puffer fish, *Canthigaster jactator* (Jenkins), with a species of nematode belonging to the genus *Philometra* Costa, 1845, caused considerable abdominal distention in the hosts. The abnormal size of both fish (Figures 1 and 2), the lack of symmetry of the swelling, and their behavior in the water attracted our attention. The 5.1 and 8.5 cm (total length) fish were captured in the waters of Kaneohe Bay, Oahu. The present report represents the first confirmed case of a philometrid-induced abdominal swelling in the body cavity of a marine fish, *C. jactator*, and represents a new geographic and a new host record for the genus *Philometra*.

One host was frozen prior to examination and the other was fixed in 10 percent formalin after the worms were removed. Nematodes were removed from the abdominal cavity of the host, were fixed in glacial acetic acid, were stored in a solution of 5 parts glycerin and 95 parts 70 percent ethyl alcohol, and were examined in glycerin after evaporation of the alcohol.

We removed seven worms from one host and five from the other. The nematodes ranged from 110.0 to 310.0 mm long by 2.5 to 7.0 mm wide and had an esophagus 1.5 to 1.7 mm long. All collected nematodes were gravid females and were free in the abdominal cavity of the host.

The abdominal distention caused by the worms was slightly asymmetrical when compared with the normal fright-induced swelling of *C. jactator* by the ingestion of water. We noted that the enlarged abdomen of one infected fish, which was kept in an aquarium for observation, periodically changed shape, indicating continual movement of the parasites within the body cavity. Outlines of portions of worms were seen through the skin of one fish (Figure 1). Figure 3 shows the large number and size of the philometrids that caused the protrusion of the host's abdomen. No lesions were found in the associated tissues.

The ability of both larvae and adults of some philometrid nematodes to cause disease in fishes has been established (e.g., Kuitunen-Ekbaum 1933, Pali 1958, Annigeri 1962, Margolis 1970, Bauer, Musselius, and Strelkov 1973, Paperna and Zwerner 1976). Few reports, however, discuss conspicuously distended tissues induced by members of this genus. The majority of these reports implicate a philometrid that occurs in the oculo-orbits of freshwater fishes as causing a condition of exophthalmia (e.g., Benz and Pohley 1980). The only report of an enlarged body cavity

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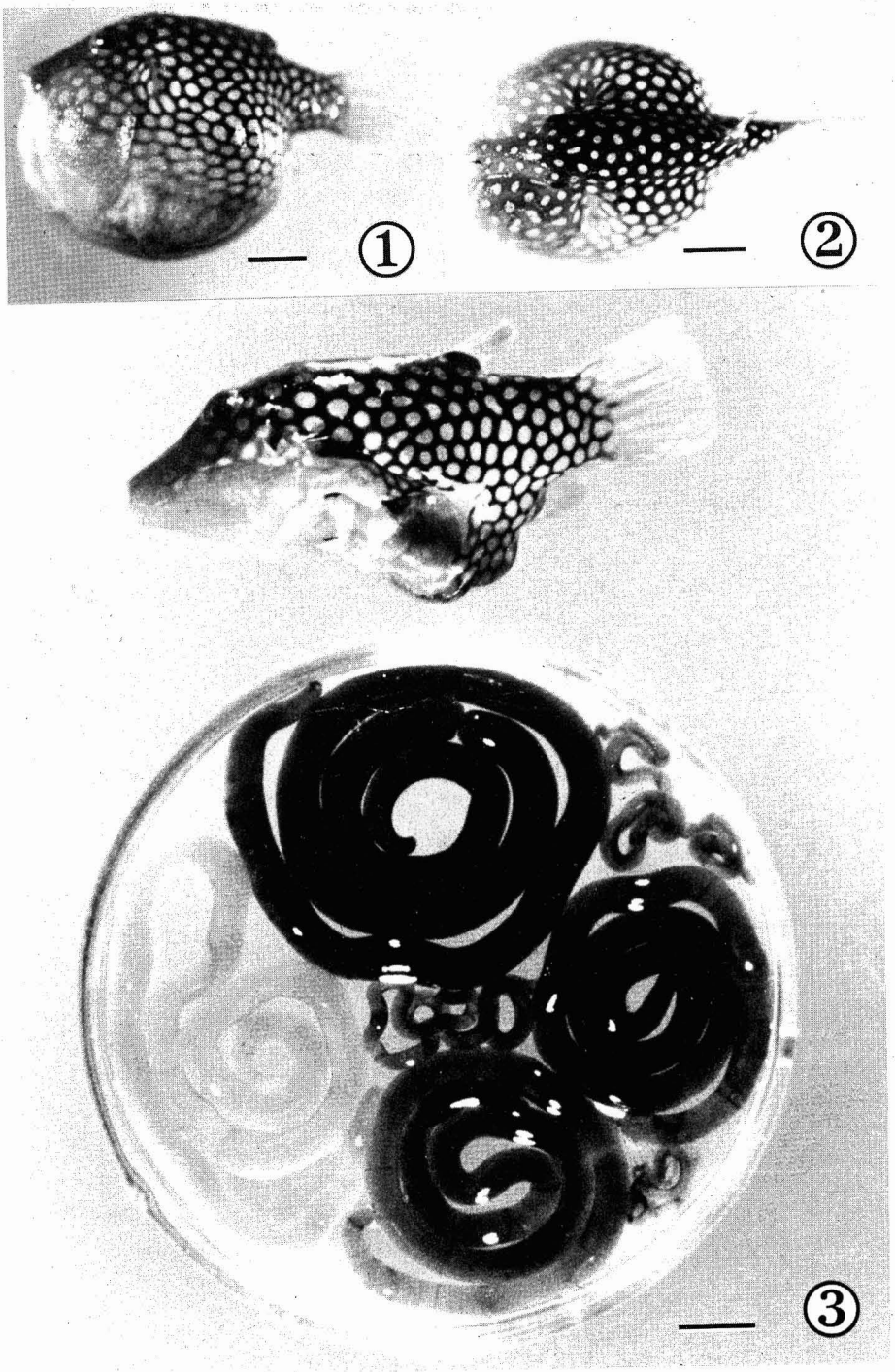

FIGURES 1–3. *Canthigaster jactator* infected with *Philometra* sp. Bars = 1 cm. *1*, lateral view of host showing distended abdomen. *2*, dorsal view of host; note asymmetry of the expanded abdomen. *3*, nematodes removed from same host.

induced by a philometrid is by Hoshina and Soguri (1952). They collected *Philometra opsalichthydis* from the liver, mesentery, and gonads of the pond smelt, *Hypomesus olidus* (Pallas), inhabiting Lake Tanegaile, Japan. Hoshina and Soguri also noted that the worms could be extruded through the genital pore of the host by pressing the swollen abdomen. We could not extrude the worms from either specimen of *C. jactator* by applying pressure to the abdomen.

Because parasitized hosts are permanently distended, the effects of this parasite on the morbidity and mortality of the puffer fish populations may be significant. We noted a buoyancy problem with one infected fish. If the fish was not wedged into a crevice in the reef, it rapidly ascended to the surface. Such erratic movements and lack of shelter would attract predator fishes. Additionally, five infected specimens of *C. jactator*, which we maintained individually in carefully monitored marine systems, all died as the nematode grew and eventually caused what appeared to be maximum abdominal distention of the host. No other reasons for the host's death were revealed at necropsy.

We observed parasitized specimens of *C. jactator* only in Kaneohe Bay, Oahu. Distended fish, however, have been observed in the waters of the Magic Island channel (Johnson 1982) and Kahe Point (Tricas, personal communication), Oahu, and from Ke'ei, Hawaii (Walsh, personal communication). Johnson (1982) briefly mentioned finding infected specimens of *C. jactator* and an unidentified species of sharp-nosed puffer and stated that internal parasites caused the puffers "to swell up dramatically." We have been unable to locate Johnson's material to identify the parasite; however, based on a photograph of the distended *C. jactator* in his paper (1982:182), it is probably the same nematode reported here.

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