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Spontaneous Tumors in the Cutlass Fish *Trichiurus lepturus* and the Dusky Spinefoot *Siganus fuscescens*

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During the past decade, I have collected two tumor-bearing marine fishes off Miyazaki Prefecture, southern Japan. One is a cutlass fish, *Trichiurus lepturus*, a benthonic inshore fish, and bore myosarcoma. The other is a dusky spinefoot, *Siganus fuscescens*, a rock-shore fish, and bore schwannoma. According to Schlumberger and Lucké (1948), Wellings (1969), Harshbarger (1977), and Kimura et al. (1983), myogenic tumors had been reported in about 20 fish species. Schwannoma had also been reported in about 40 fish species, with high frequency in snappers (Lutjanidae) along the Florida coast, U.S.A. (Lucké, 1942; Wellings, 1969; Harshbarger, 1977; Ferguson, 1989). The present study describes the histological features of myosarcoma and schwannoma in the above two marine fishes.

Materials and methods

The tumor-bearing cutlass fish, *Trichiurus lepturus*, was caught by angling offshore from Nichinan City, southern Miyazaki Prefecture, in June 1979. The fish was probably about 90 cm in total length, although this is conjecture, since only the tumor-bearing portion was brought to the laboratory. The dusky spinefoot, *Siganus fuscescens*, with tumor was caught by an inshore set-net, off Nobeoka City, northern Miyazaki Prefecture, in October 1989. It was 31 cm in total length. These specimens were preserved in 10% formalin. Their tumor tissues were embedded in paraffin and cut into thin sections following standard proceedings. Sections were stained with hematoxylin-eosin, Mallory's azan, alcian blue-PAS, PTAH, and Bodian stain.

Results

Myosarcoma in *Trichiurus lepturus*. The tumor was located at the base of the dorsal fin and extended along the dorsal musculature (Fig. 1). Some fin rays were also involved in the tumor tissue. The tumor was 4 cm in length × 2 cm in height × 1.5 cm in width and had a slightly soft texture. Its color was whitish except for its central region, which was dark brown.

The surface of the tumor tissue lacked a distinctive capsule. The tumor tissue extended beyond the underlying subcutaneous tissue, superficially infiltrating muscle tissue where the muscle fibers fell into necrosis. The tumor cells were divided into three types, according to their histoiogical features. The first type had large, round-to-oval cells with abundant basophilic cytoplasm and one or two central nuclei (Fig. 2). In the second type, the cells exhibited a tadpole or racket shape, having a single nucleus in the expanded end (Fig. 3). The third type had strap-shaped cells with several nuclei (Fig. 4). These histological aspects of the tumor cells seem to be characteristic of myosarcoma. The stroma of the tumor tissue consisted of delicate to coarse collagenous fibrils, elongated cells which resembled fibroblasts, and small lymphoid cells. These stromal components were especially well developed in the peripheral area of the tumor tissue. Small hemorrhages were often present in the tumor tissue, but vascularization and mitotic figures were poor.

Schwannoma in *Siganus fuscescens*. The fish had a tumor on the upper lip (Fig. 5). The tumor was almost round, 2 cm in diameter, dark brown in the upper region and white in the lower. Its texture was relatively rigid.

The tumor tissue had neither invaded the underlying subcutaneous tissue, nor extended laterally. The free surface of the tumor was encapsulated by a thin collagenous membrane. Melanophores were lined up below the collagenous capsule. The distribution of melanophores was dense in places. The tumor tissue possessed three principal components: fibrocytic cells, intercellular fibrils, and lacunae (Fig. 6). These components were found in two kinds of arrangements. The first consisted of a compact and richly-cellular arrangement with tightly-packed fibril bundles (Fig. 7). However, typical palisade-patterns of cell disposition were rare. The other was a poorly-cellular arrangement with slender fibril strands. Many lacunae, having irregular shapes and sizes, were interspersed at random, principally among the slender fibril strands (Fig. 8). A myxoid substance and lymphoid cells were frequently observed in the lumens of the lacunae. Both types of arrangements usually coexisted, but occasionally one or the other predominated. Nerve fibers were not located in the tumor tissue by specific staining. The varying den-

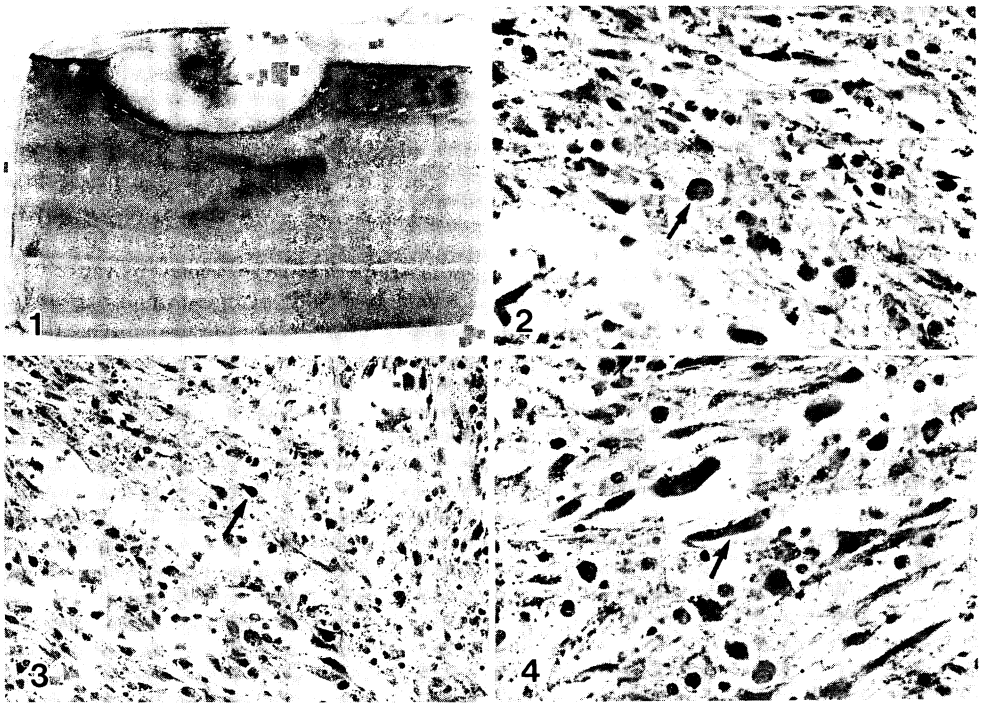

Fig. 1. Tumor in a cutlass fish *Trichiurus lepturus*. ×¾.
Fig. 2. Large, oval cell with two nuclei (arrow) in the tumor tissue of *Trichiurus lepturus*. H-E stain. ×520.
Fig. 3. Racket-shaped cell (arrow) and the other tumor components in the tumor of *Trichiurus lepturus*. H-E stain. ×210.
Fig. 4. Strap-shaped cell with three nuclei (arrow) in the tumor tissue of *Trichiurus lepturus*. H-E stain. ×520.

sities of cells, in addition to myxoid degeneration, enabled this tumor to be diagnosed as schwannoma. In most of the lesions of the tumor tissue, vascularization was relatively poor. Mitotic figures were not recognized anywhere in the tumor tissue.

Discussion

In the past studies of the fish tumors in the Japanese coast, one of the important contributions was the findings and identifications by Takahashi (1929) who reported the up to 100 neoplasms. The research of the fish tumors was recently reviewed by Masahito et al. (1988). Regarding the tumors in *T. lepturus*, osteoma and fibroma were reported (Schlumberger and Lucké, 1948; Honma, 1976). The present report of the tumor in *S. fuscescens* is thought to be the first record for this species.

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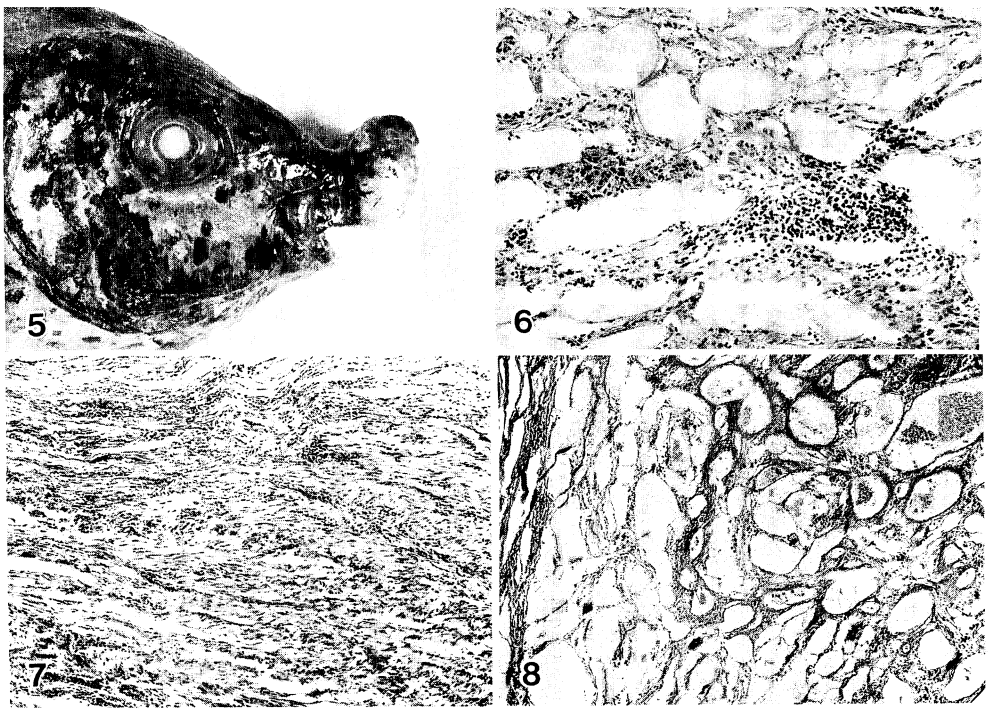

Fig. 5. Tumor-bearing dusky spinefoot *Siganus fuscescens*. ×5/7.
Fig. 6. Fibrocytic cells, intercellular fibrils, and lacunae in the tumor tissue of *Siganus fuscescens*. H-E stain. ×210.
Fig. 7. Richly-cellular tumor tissue with tightly-packed fibril bundles in *Siganus fuscescens*. H-E stain. ×50.
Fig. 8. Many lacunae with myxoid substances and slender fibril strands in the poorly-cellular tumor tissue of *Siganus fuscescens*. Azan stain. ×50.

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タチウオとアイゴの自然発生腫瘍

延東　真

タチウオ *Trichiurus lepturus* の筋肉腫とアイゴ *Siganus fuscescens* の神経鞘腫について報告する．タチウオの筋肉腫は背鰭の基部にあって，軟条を巻き込んで広がり，下部筋肉組織へ浸潤していた．その腫瘍組織は 1-2 個の核を持つ丸型細胞，オタマジャクシ型の細胞，および多核の帯状細胞によって特徴づけられた．一方アイゴの神経鞘腫は，球形で上唇に位置し，下部組織へ浸潤していなかった．その腫瘍には，線維が密に走り細胞密度の高い腫瘍組織と，線維が疎雑で細胞密度の低い腫瘍組織があった．また，類粘液物質を持つ，不定形の空隙が細胞密度の低い腫瘍組織に，多数観察された．

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