

Papillomatous Growth in Sole from Wakasa Bay Area.*† (32041)

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The occurrence of papillomatous growth on the surface of the sole has been previously reported(1). Recently, Wellings *et al*(2,3) have carried out an elaborate survey of flathead sole population in waters of San Juan Island, Washington and observed neoplastic lesions on approximately 6% of the fish of the species. Since sole is one of the commonly eaten fish in Japan, it was of interest as to whether such tumor-bearing fish could also be observed in water bodies around the country. A preliminary survey to search for tumor-bearing fish was carried out in the Wakasa Bay area, a well-known center for sole fishing on the Japan Sea coast. This paper reports the occurrence of similar epidermal lesions in sole from the waters of the area.

Methods. Fishes with lesions doubtful for epidermal hyperplasia and papillomatous growth were sought among those caught by commercial fishermen in the Wakasa Bay area. Bottom trawling is a commonly used fishing method for sole in this area. The fishes with suspected lesions were merely picked from the fishing boat or from the fresh material on its arrival at the processing factory. Quantitative study to determine the ratio of tumorous fish among the whole fish population of the area was not carried out in this survey. The fish were deep-frozen or fixed in 10% formalin and were transferred to our laboratory in Nagoya for further histopathological observation. The fishes were identified by species and their age was estimated by their total and standard lengths and by a count of growth rings on ear ossicles.

The tumorous growths were measured, photographed and a representative portion of the growth was subjected to microscopic observation. The estimated age of fish in the present study was approximately 10 to 12 months. The formalin-fixed tumor specimens were embedded in paraffin, sectioned at 3 μ , and stained with hematoxylin and eosin, periodic acid Schiff (PAS), phosphotungstic acid hematoxylin (PTAH), and Mallory azan. Subsequently, fishes were dissected to see whether visceral tumors or metastatic lesions, if any, could be detected.

The survey lasted from the beginning of December, 1965 to the end of May, 1966 which was about two-thirds of the yearly fishing season for sole in this area.

Results and discussion. During the survey, 5 fish with apparent tumorous growth were collected. One, F-1 (*Limanda herzensteini*) was transferred from Maizuru and the others (*Hippoglossoides dubius*) were brought from Kasumi. The data are summarized in Table I.

A growth seen on the pigmented side of one fish (F-1) showed a dark black coloration in gross appearance (Fig. 1). The microscopic observation revealed increase in melanin-containing cells together with the proliferation of both epithelial and fibrous tissue (Fig. 3 and 4). The lesions in the other 4 fishes (F-5, 6, 10 and 11) showed less pigmented appearance as represented by a lesion on F-6 and F-10 (Fig. 2 and 3). The histology of growths was characterized by vast papillary proliferation of large polygonal cells presumably of epithelial origin as shown in Fig. 5 and 6. No definite invasion of the tumorous tissue into the deeper layer was observed nor were visceral lesions detectable in any of these cases. These findings in general were similar to the description of skin tumor in *Hippoglossoides elassodon* reported by Wellings *et al*(3).

Summary. A preliminary survey for tumor-

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bearing fish among sole caught in waters of Wakasa Bay area, Japan was carried out. Five sole, one *Limanda herzensteini* and 4 *Hippoglossoides dubius*, with skin tumors were

obtained. Histological observations of the lesions in both species revealed marked proliferation of epithelial elements accompanied with increase in fibrous structure of connec-

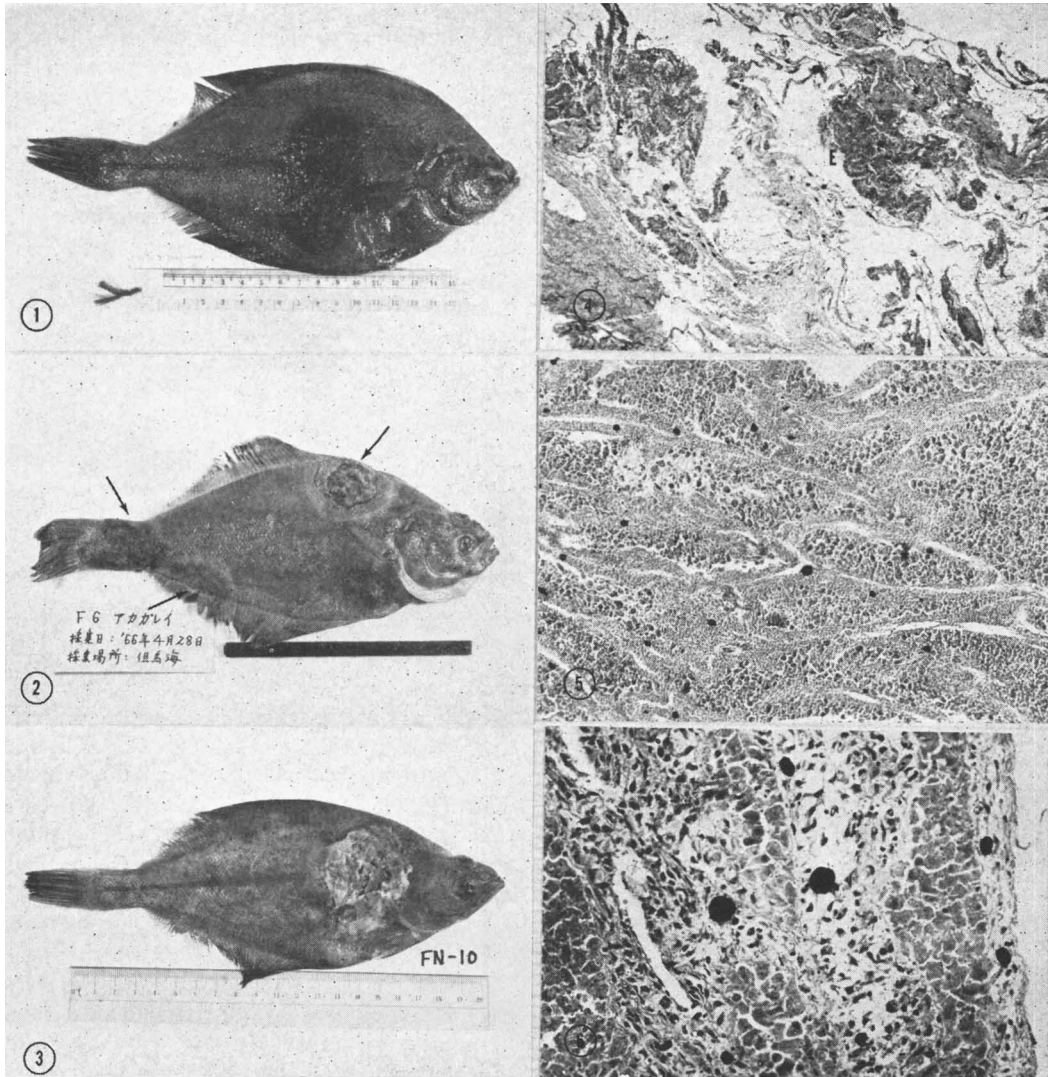


FIG. 1. Gross appearance of tumorous growth in *Limanda herzensteini* (Case F-1). A darkly colored tumor is seen on pigmented side of fish.

FIG. 2. Three flat tumors with grey color (indicated by arrows) on *Hippoglossoides dubius* (Case F-6). A growth seen at upper part of fish shows sign of ulcerative change.

FIG. 3. *Hippoglossoides dubius* (Case F-10) with ulcerated tumor near neck, on pigmented side.

FIG. 4. Histological section of the papillomatous growth of *Limanda herzensteini* (Case F-1). Epithelial cells with basal cell arrangement (E) and melanophore-containing stromal elements are shown. Cavernous spaces seen between these elements are probably due to postmortem degeneration of the tissue. (Mallory-azan stain $\times 35$).

FIG. 5. Histological feature of papillomatous growth in *Hippoglossoides dubius* (Case F-6). Nests of epidermal cells are surrounded with connective tissue elements. Note many heavily melanin-laden cells in stroma. (Mallory-azan stain $\times 87$).

FIG. 6. High power view of the same tumor as illustrated in Fig. 5. (Hematoxylin-eosin stain $\times 218$).

TABLE I. Papillomatous Growths in Soles Collected from Wakasa Bay Area.

Fish No.	Species	Standard length (mm)	Tumorous growth—		
			No.	Location	Size (mm)
F-1	<i>Limanda herzensteini</i>	212	1	pigmented side	43 × 77 × 1
F-5	<i>Hippoglossoides dubius</i>	181	1	unpigmented side	48 × 51 × 4
F-6	<i>Hippoglossoides dubius</i>	225	3	pigmented side	31 × 31 × 5
				pigmented and (unpigmented side)	43 × 25 × 2.5 (33 × 27 × 1.5)
				pigmented and (unpigmented side)	44 × 25 × 2.5 (36 × 13 × 1.0)
F-10	<i>Hippoglossoides dubius</i>	200	1	pigmented side	44 × 49 × 5
F-11	<i>Hippoglossoides dubius</i>	181	1	pigmented side	37 × 32 × 5

tive tissue. In addition marked increase of melanin-containing cells was observed in tissue sections of growth of *L. herzensteini* with darker appearance. The gross and microscopic findings of *H. dubius* resembled descriptions of the epithelial papillomas reported by other authors to occur among flathead sole populations near Friday Harbor, Washington.

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Direct Percutaneous Determination of Systemic Blood Pressure and Production of Renal Hypertension in the Cat.* (32042)

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In any study of persistent experimental hypertension it is desirable to be able to make repeated determinations of the blood pressure, for long periods, in the unanesthetized animal. Most previously published determinations of the blood pressure of the cat have been in the form of kymographic records of the direct mean pressure of anesthetized, heparinized animals usually subjected to various surgical procedures used in brief physiological experiments or pharmacological tests(1). These determinations are made intermittently, or continuously, during a brief experiment, and the method employed for determination of the blood pressure usually involves cannulation of a carotid, fem-

oral, or other artery in an anesthetized animal. In such experiments, the depth of anesthesia usually varies in different animals, and even in the same animal, with consequent effects on the blood pressure. The number of determinations which can be made in the same animal, by cannulation of an artery, at intervals of days, is limited. Liddell and Carleton(2) did make repeated determinations of the blood pressure in normal, unanesthetized cats, by use of the exteriorized artery implanted within a loop of skin, a technique described by van Leersum(3) for the dog, and used by Dominguez(4) for the rabbit. This method, however, gives values for only the systolic blood pressure, and the accuracy is questionable, because the endpoint is subjective, being determined by the palpation of the loop distal to the cuff, and greatly affected by the snugness with

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