

## POSSIBLE VESTIGIAL TEATS OF KILLER WHALE

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In each species of mammal, the mammary gland has developed through many steps of evolution. As seen in the platypus, the most primitive stage of the mammary gland has no distinct teats. Mammals that have multiple birth, e.g. the pig, have multiple teats others show some trace of origin from multiple teats but have changed substantially to a pair or pairs while the remaining teats have degenerated.

In evolutionary sequence two row of teats, in pairs, occur along the whole ventral surface between the forelimbs and the anus. In the elephant and the dugong, the first teats, located between the forelimbs have remained, in primates it is the second pair, and in some ungulates, the rear ones have remained. The vestiges of once functional teats are seen in many mammals. It is often seen in man that a tiny spot is found at an arm base as a vestige of the first teats and a spot sometimes present on the abdomen is likely to be one of the third teats. Sometimes these are found even in males.

To date, the teats of cetaceans have been considered as derived from the most rear pair. In my own experience I have observed thousands of whales over a long period and have examined the ventral surface in nearly every case. However I had seen no such vestige until recently.

When keeping the killer whale became popular among oceanariums of the world, I saw for the first time a tiny spot or two on some killer whales' bellies. Then in 1971, when I paid a visit to the Vancouver Public Aquarium I met "Hyak", a well trained killer whale, and found a pair of clear spots on his beautiful white belly. Then I had a chance to observe another case on the belly of one of the specimens in the Kamogawa Seaworld. Though, there has been no anatomical proof until now, those spots might be vestigial teats. The observed individuals are all thriving in each oceanarium. So, I would like to publish the evidences as a fact, in order to evoke interest of scientists and aquarium attendants in the hope that any one who has a chance to dissect a body of a killer whale, will not miss an anatomical examination on the spot and publish a report on a problematic vestige.

I should like to express here, my sincerest gratitude to Dr. M. A. Newman of the Vancouver Public Aquarium for his cooperation since I first saw Hyak until this publication and to Miss Susan Hoffer, research assistant to Dr. Newman, for much trouble in taking photographs of Hyak from difficult angles. I am also deeply appreciative of the kind help by the staff members of the Kamogawa Seaworld.

## EXPLANATION OF PLATE

The belly of the killer whale with vestigial teats.

Fig. 1. "Jumbo" of the Kamogawa Seaworld (upper left).

Fig. 2. "Hyak" of the Vancouver Public Aquarium (upper right and Fig. 3 (lower)).



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