Japanese Journal of Ichthyology
Vol. 18, No. 4 Decemebr 25, 1971

魚類学雑誌
18巻4号 1971年12月25日

# A Stingray, *Dasyatis akajei*, with Aberrant Pectoral Fins from the Japan Sea*

Yoshiharu Honma and Chiyota Sugihara

(Received August 25, 1971)

In the autumn of 1970, the second author had an occasion to examine the specimens of some marine animals deposited in the Museum of Faculty of Education, Yamagata University. There he noticed an unfamiliar specimen of batoid fish. The specimen was caught off the coast of Nezugaseki Village, Atsumi Town, Yamagata Prefecture, and reared in the Kamo Aquarium of Tsuruoka City for a while. In order to determine the specific name, the material was forwarded to the first author through the courtesy of Prof. S. Suzuki, Biological Laboratory, Faculty of Education. Yamagata University Without difficulty, this was diagnosed as a young stingray, *Dasyatis akajei* (Müller et Henk), that is very common in the temperate waters along the Japanese coasts. Measurements, counts, and main characters of body parts coincide well with the keys and descriptions of Matsubara(1955), and of Lindberg and Legeza (1959), except abnormal portions (Fig. 1). These are as follows: length of disc 125 mm, and 1.4 in tail length (173 mm); disc breadth 152 mm; diameter of orbit 10 mm, distance between eyes 31 mm, orbital space 20 mm, tip of snout to orbit 16 mm, length of spiracle 10 mm, distance between spiracles 30 mm, length of mouth 14 mm, distance between inner edges of nostrils 15 mm, length of right gill openings in the largest 8 mm, length of spine on tail 30 mm, length of cloacal aperture 11 mm, length of left pelvic fin in anterior outer margin 27 mm, right one 29 mm, length of left pectoral fin 114 mm, right one 120 mm; weight of body 130 g.

Because of pectoral abnormality, the general form of the disc appears to be rather a trapezium, and the snout projects remarkably, resembling the shape of a shield or a wedge, though its tip is blunt. Three papillae are found in the central portion of the floor of buccal cavity. The body is smooth except a pair of the masses of minute prickles behind the spiracles. The length of tail is much longer than that of the disc, and slightly greater than the breadth of the disc. The tail with a strong, horny and saw-toothed spine gradually tapers into a whip. Behind the spine, membranous dermal folds in dark color, exist on both dorsal and ventral sides. No claspers are found near the paddle-shaped pelvic fins. This specimen appears to be female, though we have not obtained histological data.

Noticeably, both left and right pectoral fins are not adherent to the cranio-thoracic region: the right fin is separated from the region of the second gill slit, and the left from the fourth one. Non-adherent wing-like pectorals project toward the underside of the snout. The grade of curvature of the left is slightly greater than that of the right fin. Consequently, the position of the right fin is forwarded more, while the tip of left one is nearer to the upper jaw. Both fins form an angle of nearly 90°. Generally speaking, the body is orange brown above, white to pale pink below, and margins of ventral side of fins are orange yellow. In the dorsal side of the thoracic region, however, a remarkable white blotch in the shape of plectrum is detected. A white belt is seen in the marginal edge of cranio-thoracic

* Contributions from the Sado Marine Biological Station, Niigata University.

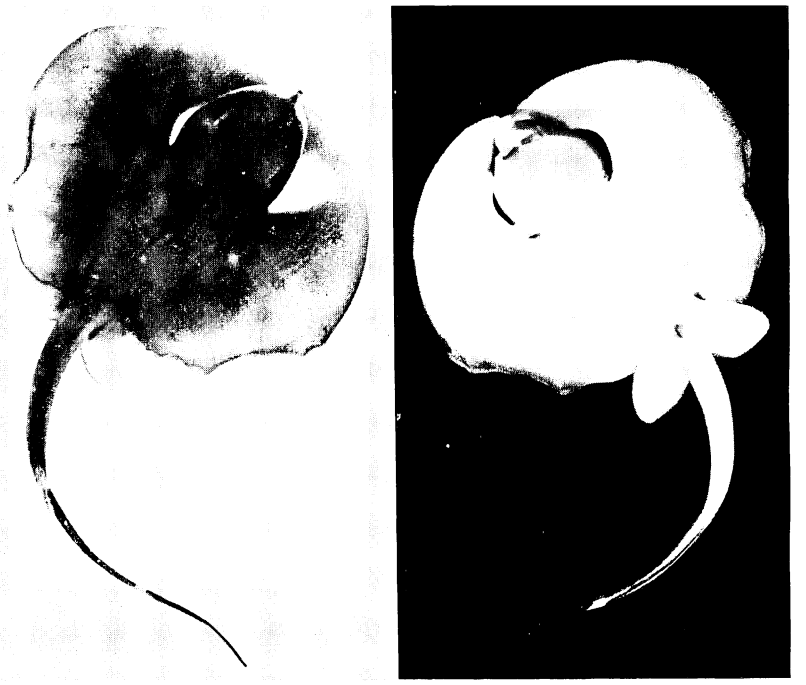

Fig. 1. A stingray, *Dasyatis akajei*, with aberrant pectoral fins obtained in the Japan Sea. ×1/3. Left, dorsal view; right, ventral view.

region when viewed from right above. No other abnormalities are recognized in this specimen (Fig. 1).

As far as the authors are aware, there is no written account of batoids with this type of aberrant pectoral fins in the waters adjacent to the Japanese Islands, while more than ten papers dealing with fin abnormalities of batoids appeared in the other waters of the world (Bigelow and Schroeder, 1953: 6, 138, 397; Chhapgar, 1964; Ford, 1930; Gill, 1896; Gudger, 1933; Harper, 1933; Johnstone, 1906; Letaconnoux, 1949; Luther, 1962; Radcliffe, 1928; Rennie, 1906; Saemundsson, 1909; Schnakenbeck, 1942; Templeman, 1965). According to these investigators, the malformation reported here seems to be derived from the failure of the anterior lobes of the pectorals to join with the head during embryonic development. Further, from the phylogenetic point of view, Goodrich (1958: 136) discussed and illustrated the shifting of median fins and paired limbs, including successive stages in the ontogeny of *Torpedo*. The cause of the present abnormality seems to be explained in relation to the anterior region of pectoral fin growing forward and the ridge of head along which the pectoral fin will grow. However, the factors which brought about and influenced this situation are still unknown.

The authors express their thanks to Prof. Shoichiro Suzuki of Yamagata University for offering the precious material. Thanks are also hereby tendered to Prof. Reizo Ishiyama of Tokyo University of Fisheries, and Mr. Muneo Okiyama of Japan Sea Regional Fisheries Research Laboratory, for information about pectoral abnormality of batoids throughout the Japanese waters and consultation of the literature.

## Literature cited

Bigelow, H. B. and W. C. Schroeder. 1953. Fishes of the western North Atlantic. Sawfishes, guitarfishes, skates, rays and chimaeroids. Mem. Sears Found. Mar. Res., 1: 1–588.

Chhapgar, B. F. 1964. A monster of the spotted duck-billed ray, *Aetobatus narinari*. Copeia, 1964 (3): 587–589.

Ford, E. 1930. Some abnormal fishes received at the Plymouth Laboratory. J. Mar. Biol. Assoc. U. K., 17: 53–64.

Gill, T. N. 1896. Notes on the genus *Cephaleutherus* of Rafinesque, and other rays with aberrant pectoral fins (*Propterygia* and *Hieroptera*). Proc. U. S. Nat. Mus., 18: 195–198.

Goodrich, E. S. 1958. Studies on the structure and development of vertebrates. Dover Publ. Inc., U. S. A., 2 vols. 1–837.

Gudger, E. W. 1933. A second barn-door skate, *Raja stabuliforis*, with pectorals non-adherent to the head. Amer. Mus. Novitates, (600): 1–10.

Harper, W. F. 1933. Supernumerary pectoral fins in *Raja circularis Loudon*. Proc. Roy. Soc. Edinburgh, (B), 53: 26–30, 2 figs.

Johnstone, J. 1906. Ichthyological notes. Trans. Liverpool Biol. Soc., 20: 330–335.

Letaconnoux, R. 1949. Quelques cas tératologiques chez les poissons. J. Cons., 16: 50–58.

Lindberg, G. U. and M. I. Legeza. 1959. Fishes of the Sea of Japan and the adjacent areas of the Sea of Okhotsk and the Yellow Sea. Pt. 1, Amphioxi, Petromyzones, Myxini, Elasmobranchii and Holocephali. Acad. Sci. USSR, 1–208. In Russian.

Luther, G. 1962. On an apparently specific type of abnormality in the white-spotted shovelnose ray, *Rhynchobatis djiddensis* (Forskål). J. Mar. Biol. Assoc. India, 3: 198–203, 2 figs.

Matsubara, K. 1955. Fish morphology and hierarchy. Ishizaki Shoten, Tokyo, 3 vols. 1–1605, 135 pls.

Radcliffe, L. 1928. A barn-door skate (*Raja stabuliforis*) with abnormal pectoral fins. Nat. Hist., N.Y., 28: 58–63.

Rennie, J. 1906. Accessory fins in *Raja batis*. Anat. Anz., 28: 428–431. 2 figs.

Saemundsson, B. 1909. Oversigt over islands fiske. Skr. Komm. Havunders, 5: 1–140.

Schnakenbeck, W. 1942. Eine akzessorische Ruckenflosse beim Stachelrochen (*Raja clavata*). Zool. Anz., 142: 88–90, 3 figs.

Templeman, W. 1965. Some abnormalities in skates (*Raja*) of the Newfoundland area. J. Fish. Res. Bd. Canada, 22: 237–238, 4 pls.

(Department of Biology, Faculty of Science, Niigata University, Niigata 950–21, Japan)

## 日本海で獲れたアカエイの胸鰭遊離奇形

本間 義治・杉原 千代太

1970 年に，山形県温海町の 鼠ヶ関沖から 採られ，一時鶴岡市立加茂水族館に飼育された体盤長 125 mm のアカエイ幼魚は，胸鰭が頭部から遊離している珍稀な標本である．このような奇形は，諸外国から数例発表されているものの，本邦水域からは未報告のものである．また，胸鰭異状の形態は，既報のものと違っている点があったので記載し，成因について考察した．

(新潟市五十嵐二ノ町 新潟大学 理学部 生物学教室・酒田市栄町 18-9)