

A New Sting Ray, *Dasyatis atratus* (Dasyatidae, Pisces),
from the Subtropical Pacific*

By

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On March 20th, 1951, a rare sting ray was rendered to the senior author from a tuna fisherman (now missing) at the fishmarket at Miya, Aichi Prefecture through the kindness of Mr. M. Oda of the market. Recently, another specimen, which is most likely identical with the former one, was sent to us from Mr. T. Iwai. Both these rays were occasionally hooked on tuna longline operated in the subtropical seas, and gave a great interest to us from their striking appearance, and were thought to be new to science.

The new sting ray herein described may be distinguished from any other relatives by its peculiar coloration, somewhat suggestive of a bathypelagic form, and other diagnostic features.

The occurrence of this species, whose group is commonly known from the shallow waters, in the pelagic seas may lead ichthyologist to hold a new opinion on the geographical distribution of *Dasyatis* group.

We return hereby sincere thanks to Mr. M. Oda, and to Mr. T. Iwai of the Department of Fisheries, Kyoto University, for kindness in putting the materials at our disposal, and also to Mr. A. Ochiai of the same University for assistance in taking a copy of literature.

Dasyatis atratus, n. sp.

New Japanese Name : Karasu-jei*

HOLOTYPE. ... Matured male, from north of the Malianas Is's, Mar. 1951, preserved in our College, measuring 1008 mm in total length.

ALLOTYPE. ... Matured female, from 20 nautical miles south off Owase, Mie Prefecture, Coll. Mr. T. Iwai, Nov. 3, 1954, preserved in the Fish. Dept., Kyoto Univ. No. 24671, measuring 1071 mm in total length.

Description. ... The measurments below were given on the formalin specimens, of which the nolotype has passed about 4 years after deposited, but we have taken good care of its preservation.

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* This common name was distinguished from "aka-jei" (*D. akajei*), which is a predominant species within the group in our coastal waters, but Japanese name commonly used for this species by our tuna fishermen is "kuro-jei".

Diagnostic features common to both holotype and allotype : Disc quadrangular, its width much greater than long ; snout very short, with small projection in its center, from thence anterior contour of disc retrogressively stretched bilaterally; latero-posterior contour of disc nearly straight from lateral angle to broadly rounded posterior angle; cranial and visceral portions surprisingly elevated, so that the depth very high as compared with rather thin pectoral fins; interorbital space broad and rather flat, which is 1.47 times into snout in both types; eyes rather large, but not so large as spiracles and interorbital space; nostrils large, separated by a narrow ridge in front of mouth; nasal valves with a small free edge projecting as a short dermal flap; upper lip or velum fringed, with a notch in its middle portion, inside the periphery of the velum a cutaneous curtain hangs with fringes on its whole margin; oral papillae 8 or more, teeth of both jaws large and more or less pointed but not so smooth as paved street, and are discriminated between sexes as described later on; many cutaneous tubercles developed all over the buccal surface, where a low elevation located at the centers of both jaws. Tail long, delicate, tapered posteriorly, suddenly slendered at the insertion of sting, where, on opposite side of tail, rises a distinct, but low (2 mm in highest portion) dermal fin fold, which extends to just below tip of sting. The sting long and stout, its length equal to distance from origin of sting to emargence of root of tail from ventral fins on dorsal surface; body almost naked in main portion of disc exclusive of small areas with spinations on dorsal boader, being contradistinguished between sexes.

Sexual dimorphism : In size, the male smaller than the female, assuming that these specimens are of normal sizes as adults in two sexes. In male, distinct, but small oral papillae 8 in main portion of the lower jaw, and followed by obscure ones on both extremities of the floor, instead of large thickened ones 6 in the half portion of the floor undamaged, in female. Teeth on oblique rows of upper jaw 19, of lower ones 21 in male, instead of 20 on upper jaw in female, in which the teeth, cuspidated, shorter and more pointed than in male. Spinations in male rather poorer than in female, about 50 large spines with quadrangular base run on vertebral series from center between lateral angles of disc to near the origin of sting, being gradually reduced posteriorly in male, but such distinct ones absent in female, being scattered many enlarged spines with stellate basal plate, setting irregularly on mid belt; very small spinulae sparsely covered on those areas in front of eyes, less closely behind nuchal, and somewhat denser from dorsal border of base of tail to the portion beneath the tip of sting in male. On the contrary, in female, sparsely armed with spinulae in front of eyes together with interorbital space and latero-posterior inner region of spiracles (which are naked male), and also the portion from nuchal to basal region of tail densely armed with asperities which are furnished with stellate base. Length of tail measured respectively from center of cloaca and from origin of sting to distal end of tail comparatively longer

in male than in female, but this relation is reversal within two sexes in the distance between mouth and center of cloaca. Both longer diameters of eye-ball and spiracle larger in male than in female in relation to head. Clasper of the male tightly rolled. A conspicuous knob developing on the tail of male behind tip of sting seems to be of accidental origin. (c. f. fig. 1)

Color : In formalin specimens strongly blackish purple or dark chocolate plum with neither any pailer nor darker blotch or spot on whole surface of body, but somewhat fainter in the ground color on ventral side; faint grayish purple on buccal surface. These colorations rather pailer in the allotype than in the holotype.

Ecology : The two specimens were collected individually from far separated waters at least more than 1000 meters in depth, and the depths at which subsequently the longlines may have been set were about 100 meters or more below the surface, so that the fish may be thought as a pelagic or bathypelagic habitant. Besides, the wide temperature difference between the two localities may be said extraordinary among those relatives included in the genus, which are generally taken from the bottom of the coastal waters. In fact, the great uniformity in its coloration, especially recognized so on the ventral as well as on buccal surfaces most probably indicates that the species is largely, if not wholly, confined to bathypelagic in the subtropical to tropical areas. It is, however, of some interest to note particulars of their capture, especially that it was hooked on tuna longline operated in mid layer of water. In having delicate, slender, elongated and pointed tail and having rather thin pectoral fins accompanied by extremely thickened head likewise characteristic features of those found in the cow-nosed ray, there may be little room for doubt, as stated above, that the new species is bathypelagic or bathybentic. Hence, it is supposed that the fish might have been hooked when she migrated up to catch her prey at night.

The probable abundance of this fish in the said waters does not mean forming a compact shoal because only several fishes were captured by means of the line at a tuna fishing.

Remarks : In the genus *Dasyatis*, important specific characters consist of number, and outline of the cutaneous processes in the floor of the mouth, and in membranous fin fold developing on the tail.

Although these characters are usually valuable for distinguishing allied species, they are not always absolutely invariable in any one species. A more exact method may be found for systematics of this group of fishes; evidently those measurements denoted above are not idealistic but of practical use in view of the present state of study on this group of fishes.

The new species having singular coloration on its whole body, characteristic of deep-sea fishes, and having numerous cutaneous oral papillae, filamentous long tail with a low fin fold, developing only on ventral surface of tail, a character which is

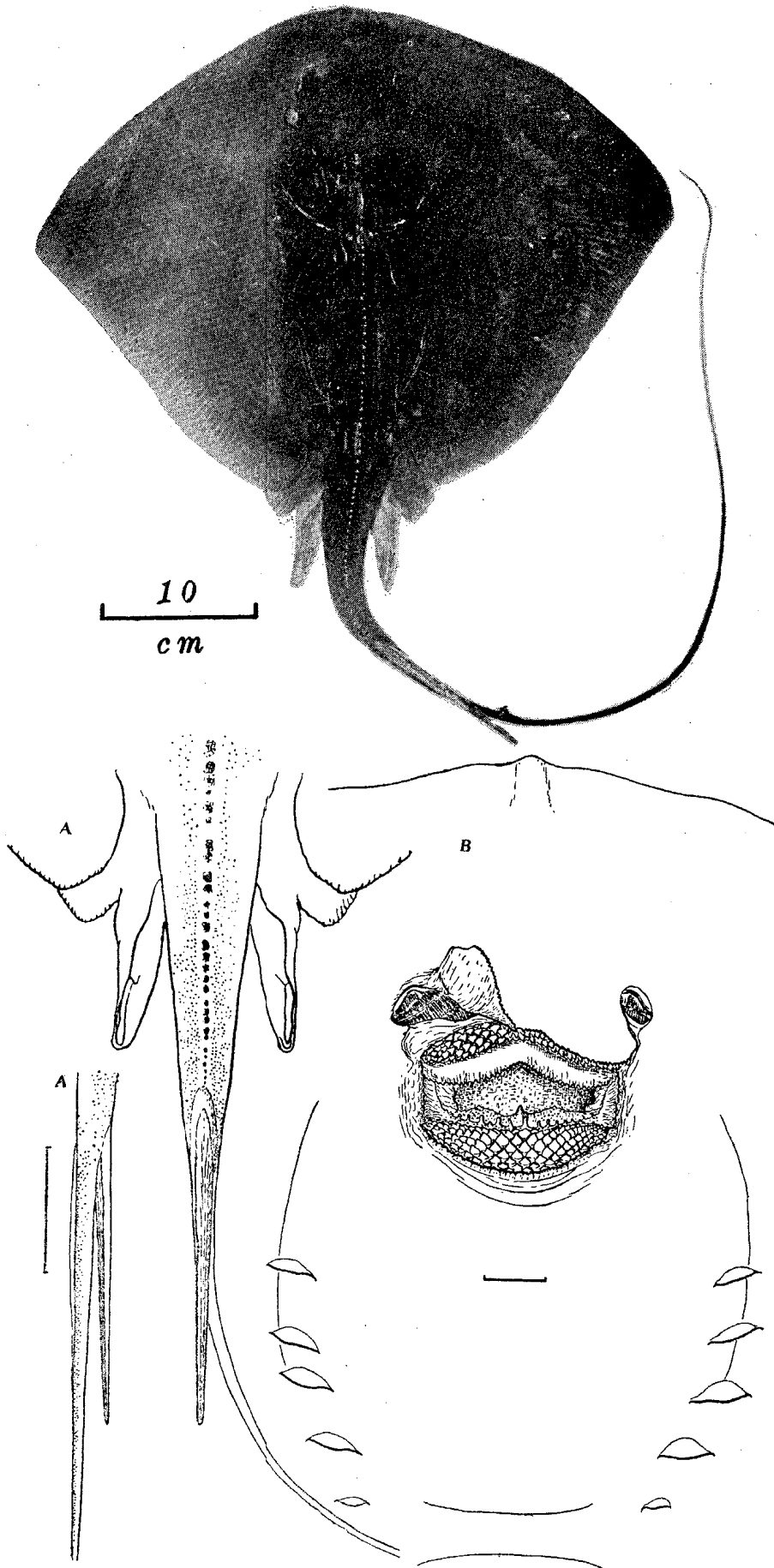


Table 1. Proportional measurements in both holotype and allotype of *Dasyatis atratus*, and relative ratios of bodily parts to disc width (D. W.) or head length (H. L.).

Items	Measurement (mm)		Ratio into D. W.	
	Holotype	Allotype	Holotype	Allotype
Total length	1008	1071	0.42	0.51
Disc width	427	552		
Disc length, to posterior ends of pectoral fins	322	552	1.32	1.00
Disc length, to posterior ends of ventral fins	343	449	1.24	1.22
Head length, to 5th gill slits	148	186	2.88	2.96
Distance between 5th gill slits and center of cloaca	140	200	3.05	2.76
Distance between the centers of mouth and cloaca	220	294	1.94	1.87
Distance between center of cloaca and origin of sting	130	171	3.28	3.22
Tail length, from center of cloaca to tip of tail	720	695	0.59	0.79
Distance between origin of sting and tip of tail	590	524	0.72	1.05
			Ratio into H. L.	
Highest depth, at the center between branchial chambers	58	57	2.55	2.48
Snout length, real distance between center of anterior margins of orbits and tip of snout	54	65	2.74	2.86
Preoral length, from center of upper jaw	65	84	2.25	2.21
Width of mouth	40	53	3.70	3.50
Interorbital space	37	46	4.00	4.07
Eye-diameter, longer axis of eye-ball	27	32	5.48	5.81
Spiracle-diameter, longer axis of the opening	22	26	6.72	7.15
Length of sting	125	157	1.18	1.18
Length of clasper, from center of cloaca to tip of clasper	110		1.34	

← Fig. 1. Upper : Holotype of *Dasyatis atratus*, n. sp.
 Fig. 2. Lower : Dorsal view of posterior portion of the body in A, and side view in A'. Ventral view of the head in B. Especially showing spination and dermal fold in A and A', respectively, and large cuspidal teeth and numerous dermal papillae on the floor of lower jaw also on buccal surface in B. Accompanying scales denote 5 cm.

rather unique in the genus.

The new species somewhat resembles *D. agulhensis* recorded from South Africa or *D. brevicaudatus* from Australia and New Zealand, which was synonymized with the former by Smith (1950). But, in either case, *D. atratus* may be readily distinguished at least in the following points: 1) uniform dark chocolate plum or related color on both sides in this new species (purplish or grayish brown above, white below in the two relatives), 2) snout very short, 2 times as long as rather large eye (eye small 8.6 in snout), and 3) dorsal surface of disc armed with spines or spinelike asperities from nuchal to base of sting (smooth or with 4 compressed acutes on middle of back).

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