Studies on the Little Toothed whales in the West Sea Area of Kyûshû-XIV

Hase iruka (Hase dolphin) caught in the South Sea Area of Saishû Is. in the East China Sea

Akira TAKEMURA, Kazumoto YOSHIDA, and Kazuhiro MIZUE

Abstract

Delphinus sp., which is called HASE IRUKA[8] (Hase dolphin) in Nagasaki, Japan, live in the west sea area of Kyushu. The authors investigated whether or not that dolphin is identified with SIEBOLD's dolphin or *Delphinus capensis*, and is different from *Delphinus delphis*. As the result of the investigation on the body color, external proportion, and skull measurement, it was proved that Hase dolphin is identical to CGAWA's *Delphinus capensis*[8][10] and it was presumed that SIEBOLD's dolphin is this species. But it is unknown if Hase dolphin is identical to TRUE's *Delphinus capensis*[2] which was caught in the coastal sea of the Cape of Good Hope.

INTRODUCTION

SIEBOLD had had Keiga KAWAHARA, a painter of Nagasaki, draw pictures of the cetaceans which were brought to the Nagasaki fish market. And he had reported on the FAUNA JAPONICA[1] about eight species among these cetaceans. *Delphinus longrostris*[1] is one of the species and its picture is shown in Fig. 1. This dolphin has been called SIEBOLD's dolphin by the authors.

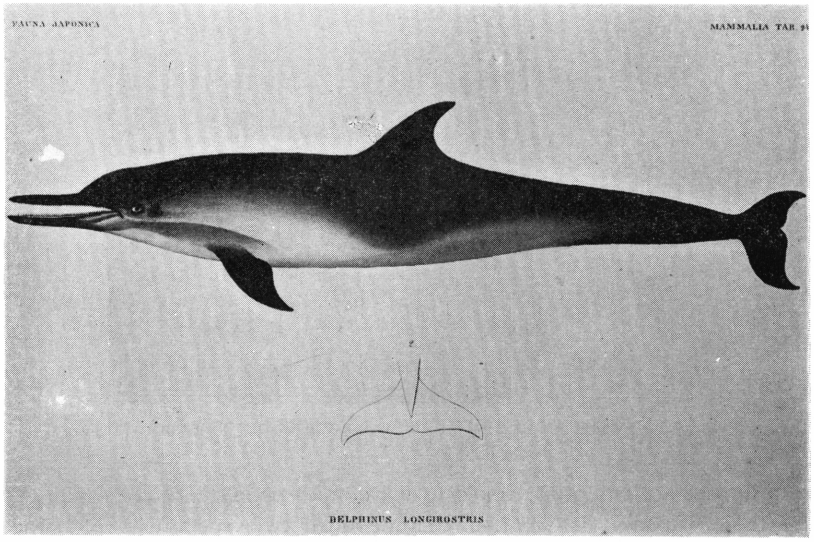

Fig. 1 SIEBOLD's dolphin

The authors sought after the taxonomical position of SIEBOLD's dolphin, and tried to find another specimen of this dolphin at the Nagasaki fish market. SIEBOLD's dolphin resemble to *Delphinus delphis* very closely in body color and form except for a few detail points as shown in Fig. 1, but the authors are surprised that the number of teeth (57-58/55) is more numerous than that of *Delphinus delphis*. In 1934, OGAWA had discovered at the Nagasaki fish market two curious dolphins which resembled closely to *Delphinus delphis*, and recognized that the number of teeth of this dolphin agree to that of the SIEBOLD's dolphin by the investigation of the skulls. He had named this dolphin HASE IRUKA (Hase dolphin)[7)8)9)10)] in Japanese which differs from MA IRUKA (Ma dolphin - *Delphinus delphis*) by the measurement of that skull, and he determined[8)] that Hase dolphin is identical to *Delphinus capensis* GRAY. Thereafter he obtained[10)] a skull of Hase dolphin at a fisheries high school in Kagoshima prefecture.

Delphinus capensis was given taxonomical position by FLOWER,[5)] TRUE[2)], SCHEFFER & RICE[3)], OGAWA[7)8)9)10)], and NISHIWAKI[13)]. However, HERSHKOVITZ[6)] treated it as the synonym of *Delphinus delphis*. It seems that there is no report on the body-color, form, external proportion, and skeleton of *Delphinus capensis* until this day (There is a simple figure of this species on Spicilegia Zoologica, 1828, pl. 12, fig, 1, and this figure has been copied on a Review of the Family Delphinidae, pl. 2, fig. 1, by TRUE[2)]).

The authors guess that this species is not few in the south sea area of Kyushu as OGAWA[10)] had indicated, although there are a few specimens in Nagasaki. In July 1955, the Nagasaki-Maru, a training ship of Nagasaki University (Captain: K. SHIBATA) discovered a large shoal of dolphins at the south sea area of Koshiki Is., and one of them was caught with the gaff. This dolphin resembled in body color and form to the SIEBOLD's dolphin in FAUNA JAPONICA and the teeth numbered 57/55. (The authors regret to say that there is no specimen of this dolphin, but a photograph is shown in Fig. 2). This dolphin was Hase dolphin.

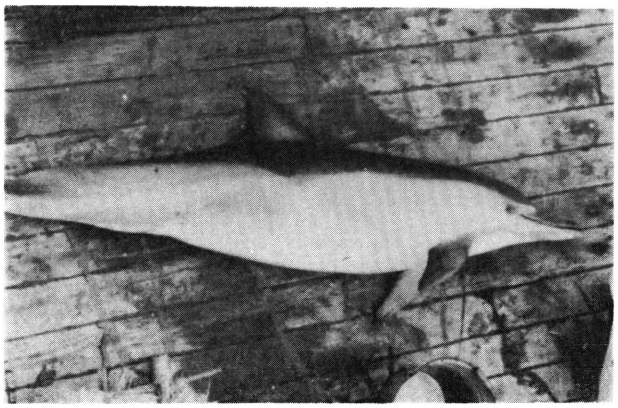

Fig. 2 Hase dolphin which was caught by Nagasaki-Maru

Thereafter, the authors long looked forward with patience to the landing of Hase dolphin at the Nagasaki fish market, and obtained two specimens of Hase dolphin recently. Investigation was made on the body color, form, body length, external proportion, number of skeletons, skull and the number of teeth. It was also examined whether these specimens (Hase dolphin) are identified with SIEBOLD's dolphin[1)], whether

Hase dolphin is *Delphinus capensis* as OGAWA[8] had reported, and if Hase dolphin and *Delphinus capensis* are of the same species whether Hase dolphin differs from *Delphinus delphis* or not.

MATERIAL and METHOD

A roundhaul netter caught a Hase dolphin in the south sea area of Saishu Is. in October 1965 and brought it back to the Nagasaki fish market. Since the head of this dolphin had already been separated from the body by the fishermen, measurement of external proportion was not available but observation and investigation were made on the other items. (Plate I, 3., Plate II, 7,)

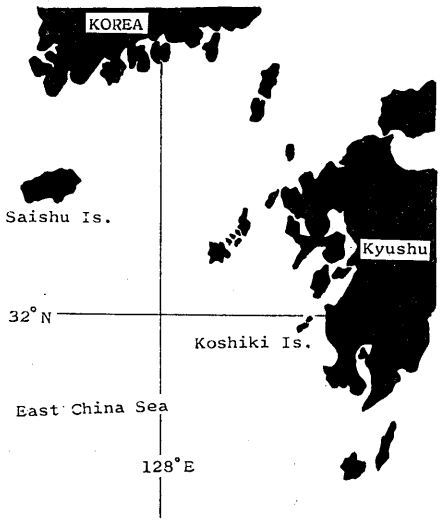

Fig. 3 Location of catch

In September 1966, another Hase dolphin was caught in the same sea area by a roundhaul netter and brought back to the Nagasaki fish market. The authors obtained a beautiful complete specimen of Hase dolphin without any defect. (Plate I, 1. 2. 4., Plate II, 5. 6. 8.)

These specimens were sent to the laboratory of Nagasaki University and observed or measured about the body color, form, body length, external proportion, skull, vertebra, sternum, os costale, cartilago costalis and alveolus.

OBSERVATION and MEASUREMENT

Body color

It is very difficult to compare in detail these specimens with SIEBOLD's dolphin[1] and OGWA's specimen[8] for the body color as there is no detailed record of this dolphin. But at a glance these resemble each other in general body color. This species has black back and white abdomen and the black color of the back projects into the white belly at the lower part of the dorsal fin (Fig. 4).

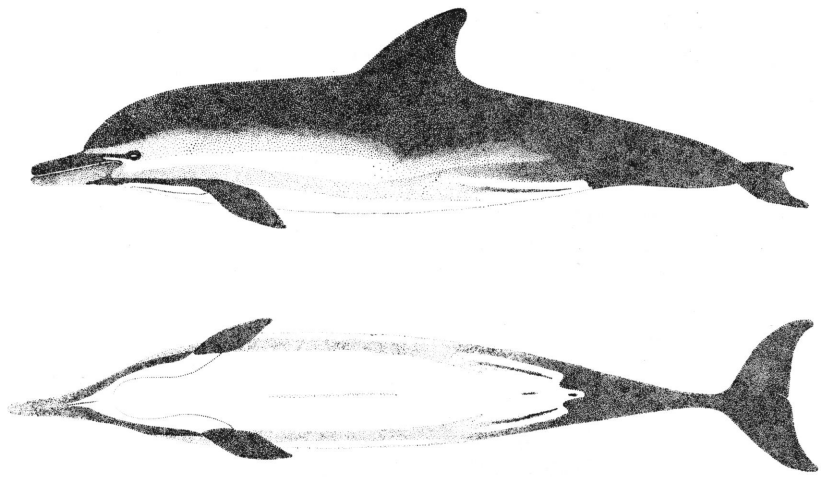

Fig. 4 Hase dolphin

In detail, there are a pair of black lines on the both sides of the pudendalis in the white portion under belly part like Hashinaga dolphin (*stenella sp.*[14]). On the both sides of the white abdomen, there is a part of wide gray belt which goes toward the pudendalis through the upper side of the flipper from the lower part of the corner of the mouth Pl. I. 2., Fig. 4,). In the head part, there is a black stripe around the eye like the spectacle and that stripe reaches the top of the keel of the forehead (Pl. I, 3, Fig. 4,). And a pair of black belts run to the lower part of the lower jaw from the front base of the flippers (Pl. I, 2. & 3., Fig. 4,). It is a very characteristic pattern in this species that there is a pair of narrow black stripe that reaches the laryngeal part of ventral side from the hind base of the flippers (Pl. I, 2. & 3., Fig 4,). The both sides of the

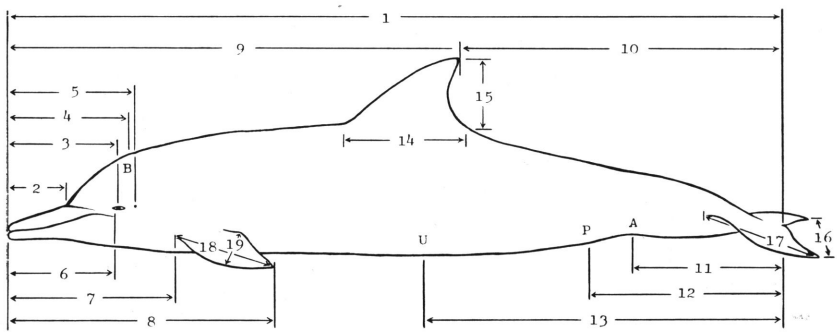

Fig. 5 Proportions of external Measurement

A···Aeus, B···Blowhole, U···Umbilicus, P···Pudentalis,

1) Body length (Snout to notch of flukes) 2) Snout to base of beak 3) Snout to center of eye 4) Snout to center of blowhole 5) Snout ot ear 6) Snout to gape 7) Snout to insertion of flipper 8) Snout to tip of flipper 9) Snout to tip of dorsal fin 10) Notch of flukes to tip of dorsal fin 11) Notch of flukes to auns 12) Notch of flukes to genital aperture 13) Notch of flukes to umbilicus 14) Base length of dorsal fin 15) Dorsal hight 16) Span of flukes 17) Maximum length of fluker (Base of flukes to its tip on the same side) 18) Anterior length of flipper 19) Maximum width of flipper

Table 1. Body length(1) in cm and ratio of external portions to body length (2~19) in percentage

Species and number of specimens	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
NAGASAKI Delphinus sp. 1	176	9.2	17.0	17.6	19.6	15.3	25.6	38.6	56.8	43.2	27.3	33.5	51.1	21.5	9.3	21.6	14.7	15.0	5.1
TRUE D. capensis 1	118		18.6				26.3								10.6			18.5	
OGAWA D. delphis 5			17.7				25.5				28.8				10.5	23.8		17.3	
OKADA D. delphis 5		6.5	17.5	17.5		13.7	25.5				29.5				10.5	23.4		16.7	
TRUE D. delphis 1	226							22.5							10.1	23.0		15.7	

flippers, dorsal fin, and tail flake are black without any spot or stripe. The gray part in front of the dorsal fin which is seen in *Delphinus delphis* was not observed in this species.

External proporton

This species much resembles *Delphinus delphis* in external form. The keel of the forehead of the dorsal median line is smoother than that of *Phocaenoides spp.* and *Lagenorhynchus spp*, and the forehead part of this speies is more slender than that of *Tursiops spp.* and *Stenella spp.*, and the border between the rostrum and the forehead is very clear. The portions for external measurement are shown in Fig. 5, and the rates or external proportions to body length of this species are shown in Table 1. The values of TRUE's *Delphinus capensis*[2], CGAWA, s *D. delphis*[8], OKADA's *D. Delphis*[11] and TRUE's *D. delphis*[2] are also given for comparison.

From this table, it is clear that the snout of this species is longer and the tail breadth is narrower than those of *Delphinus delphis* (numbered portions 2, 6 and 16)

Skull measurement

The parts of skull measurement are shown in Fig. 6.

The values of skull mensurement of two specimens are shown in Table 2 for

Table 2. Ratio of skull portion to body length (1), ratio of various portions of skull to its total length(2~15), and ratio of various portions of mandible to its total length(16~20)

Species number of specimen	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
NAGASAKI Delphinus sp 2	24.3	63.3	19.9	4.7	9.7	55.6	77.0	74.8	32.9	30.8	14.13	7.0	22.5	32.8	84.3	16.3	63.7	16.3	39.9	98.1
OGAWA D. capensis 3		63.8	18.1	4.9	9.4	55.2	73.5	76.4	33.1	29.4	13.9				85.8	16.7	63.0	16.1		
TRUE D. capensis 1		65.1	18.9		10.4				33.9		16.3									
OGAWA D. delphis 8	24.3	59.4	22.0	5.4	11.6	50.5	71.3	72.6	33.6	33.2	15.9				85.0	12.4	57.3	17.7		
OKADA D. delphis 6	22.6	62.5	22.9	5.1	12.3	51.8	73.0	75.0	38.9	32.6	15.4				86.0	12.9	59.2	23.5		
TRUE D. delphis 1	20.7	60.3	19.9		11.3				36.6		15.4									

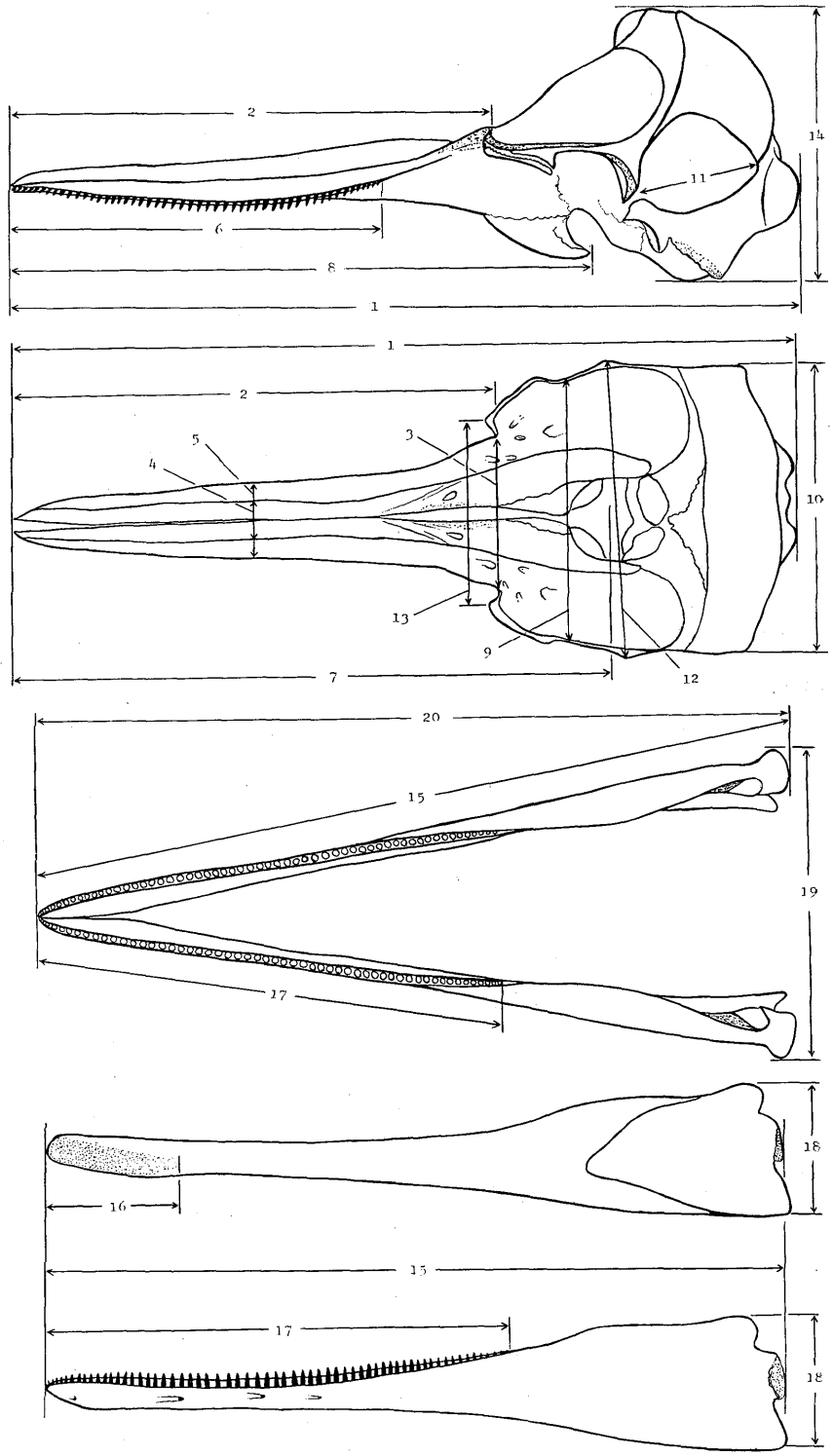
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Fig. 6 portions of skull measurement

1) Length (Tip of premaxillories to occipital condtles)
2) Length of rostrum (Level of antorbital to tip)
3) Width of rostrum at base (Between antorbital notches)
4) Width of os incisivum at the rostrum at middle
5) Breadth of rostrum at middle
6) Length of maxillary tooth row
7) Distance from tip of rostrum to center of blowhole
8) Distance from tip of rostrum to posterior edge of facies palatina of os pterygoides
8) Distance from left to right orbit
10) Length from left to right posterior edge of temporal fossa
11) Maximum length of temporal fosse
12) Maximum breadth of skull
13) Distance between processus corpus maxillae
14) Maximum height of skull
15) Length of mandibles
16) Length of symphysis
17) Length of mandibular tooth row
18) Heigth of mandibles

comparison with those of TRUE's[2] and OGAWA's *Delphinus capensis*[8] and TRUE's[2], OGAWA's[8] and OKADA's[11] *Delphinus delphis*.

From this table, it is clear that the values of the portions 2, 6, 7, 8 and 17 of this species and *D. capensis* are larger than those of *D. delphis*, these parts are occupied mainly by the length of snout, and the portions 4 and 5 are smaller than those of *D. delphis*. From these facts, it is known that this species has a longer but narrower snout than *D. dehlpis* and that these values much resemble those of TRUE's and OGAWA's *D. capensis* The values of portions 3, 9 and 10, which show the width of skull, are much smaller than those of *D. delphis*. It is clear that this skull is more slender than that of *D. delphis* but very similar to that of *D. capensis*. It is characteristic in the specimens as well as in OGAWA's *D. capensis* that the length of symphysis of both mandibles is much longer than that of *D. delphis* and that the dimension of fossa temporale (portion number 11) is smaller than that of *D. delphis*.

The both os incisivums of these specimens fuse at the rear median line of the dorsal side (Pl. III,9,). The vertical grooves in the innermost half of maxilla are not so deep and are absent in the front half (Pl. III,10,).

Table 3. Number of vertebrae in various portions

Species and number of specimens	NAGASAKI Delphinus sp.	OGAWA D. capensis	OGAWA D. delphis	OKADA D. delphis	NISHIWAKI D. delphis	TRUE D. delphis
Vertebrae	2	1	6	9	?	?
Total vartebrae	74	72	74～78	73～75	73～74	72～76
Cervical	7	7	7	7	7	7
Thoracic	15	14	13～15	13～14	14	14～15
Lumber and caudal	52	21 30	20～22 32～35	20～23 30～33	21 31～32	21～22 30～32
Fused cervical	2	2	2	2	2	2
2 head thoracic	5～6	5	4～6	?	4～5	?
Chevron	30	10	?	22～27	22～27	?

Number of vertebrae

The number of vertebrae of these specimens is shown in Table 3 with that of *D. capensis*[2] and *D. delphis*[2,8,11,13]. Authors do not discover the difference between the values of these specimens.

Number of os costale and cartilago costalis and sternum

Number of os costale, two headed os costale, cartilago costalis is shown in Table 4 and the connection of cartilagines costale to the sternum was identical to that of *D. delphis*[11,13]. The number of ossa costlia and two headed ossa costalia of this specimen is more than that of *D. delphis*, and the last os costale is separated from processus transversus vertebrae thoracicae. The connection between sternum and cartilago costalis is shown in Fig. 7.

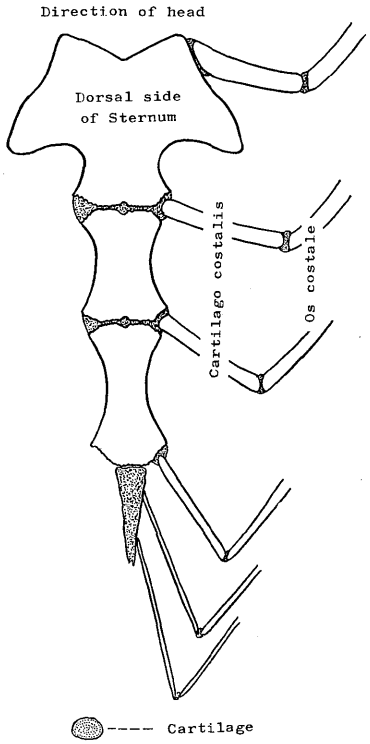

Fig. 7 Sternum, os costale and cartilago costalis

Table 4. Number of bones in various portions

Species / Bone	NAGASAKI Delphinus sp.	NISHIWAKI D. delphis	OKADA D. delphis
Os costale	15	14	13～14
Cartilago costalis	9	9	6～9
Cartilago costalis connected to sternum	6		6
Two-headed os costale	5～6	4～5	3～5

The first six pieces of cartilago costalis are connected to the sternum, but three others are free from it and the last one is short.

Number of teeth

The number of teeth of these specimens is shown as alveolus in Table 5 in order to compare it with that of SIEBOLD's dolphin[1], *Delphinus capensis*,[2][8] and *D. delphis*[2][8][11]. The number of teeth of SIEBOLD's dolphin was counted from the figure in FAUNAJAPONICA.

From this table, it is clear that these specimens resemble in number of alveolus SIEBOLD's dolphin and OGAWA's *D. capensis* but differ from *D. delphis*. In view of the number of teeth TRUE's *D. capensis* resembles *D. delphis* rather than these specimens, SIEBOLD's dolphin and OGAWA's *D. capensis*

Table 5. Number of alveolus

Specis and number of Specimens	SIEBOLD's dolphin	NAGASAKI	OGAWA	TRUE	OGAWA	OKADA	NISHIWAKI	TRUE
		Delphinus sp.	D. capensis	D. capensis	D. delphis	D. delphis	D. delphis	D. delphis
Part	1	2	3	1	8	9	?	?
Sex	?	(♂:1)(?:1)	(?:3)	(?:1)	(♀:1)(♂:4)(?:3)	(♂:1)(♂:5)(?:3)	?	?
Upper Right	57or 58	53～54	54～55	48	44～47	41～40	40～50	47～50
Upper Left		53	55		44～49	41～48		
Lower Right	55	52～53	51～54	48	44～48	41～46	40～50	46～51
Lower Left		53～54	52～55		44～50	42～47		
Total		211～21	212～214	192	177～194	168～188		

DISCUSSION

It is clear that these specimens are Hase dolphins and identical to OGAWA's *Delphinus capensis*[8] and SIEBOLD's dolphin[1], because these dolphins were caught in the same sea area in the first place, and they much resemble each other in body color, external proportion, values of skull measurement and number of teeth. But it seems that these specimens differ from *Delpinus delphis* in body color, external proportion, values of skull measurement and skull form, number of os costale and two headed os costale and number of teeth.

However, it is doubtful that Hase dolphin is identical to TRUE's *Delphinus capensis*[2] which had been caught at the coastal sea of the Cape of Good Hope, in view of the number of teeth and the values of skull measurement, and moreover the locations of catch of Hase dolphin and TRUE's *Delphinus capnsis* are very distant It is hoped that several more individuals of *Delphinus capensis* be caught in the adjacent water of south Africa to provide complete information.

CONCLUSION

1. Two Hase dolphins are caught in the south sea area of Saishu Is. by the fishermen of roundhaul netter, and the authors investigated on the body color, external proportion, skull measurement, vertebratae, ossa costalia and cartilagines costales, sternum and teeth.
2. This species is not so popular in Nagasaki, but it seems that it is not few in the south west sea area of Kyushu.

3. The body color of this species is shown in Fig. 4 and Pl. I, II, and it has characteristic patterns.
4. The values of the external measurement are shown in Table 1. The snout is longer and the tail breadth is narrower than those of *Delphinus delphis*.
5. The values of skull measurement are shown in Table 2. The snout of this species is longer and narrower than that of *Delphinus delphis*, and this skull is more slender than that of *D. delphis*.
6. The number of vertebrae is shown in Table 3.
7. The relationship among sternum, cartilago costalis and os costale is shown in Fig. 7. The number of os costale, two headed os costale and cartilago costalis are shown in Table 4. The number of os costale and two headed os costale is more than that of *D. delphis*.
8. The number of teeth is shown in Table 5 as that of alveoli. In this respect, this species resembles SIEBOLD's dolphin and OGAWA's *D. capensis*, but differs from *D. delphis*.
9. It is estimated that Hase dolphin is identical to SIEBOLD's dolphin and OGAWA's *Delphinus capensis*, and it differs from *Delphinus delphis* by above reasons. But it is doubtful that Hase dolphin is identical to TRUE's *Delphinus capensis*.

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EXPLANTATION of PLATES

Plate I.

1. Lateral view (1966)
2. Ventral view (1966)
3. Pattern at lateral view of head (1965)
4. Pattern at the abdominal region (1966)

Plate II

5. Dorsal view from anterior side
6. Dorsal fin
7. Flipper
8. Dorsal view of tail fluke

Plate III

9. Dorsal view of skull
10. Ventral view of skull
11. Lateral view of skull
12. Posterior view of skull

Plate IV

13. Lateral view of mandible of inner and outer sides
14. Dorsal and ventral views of mandible
15. Ventral view of sternum and scapulas
16. 1st-7th cervical vertebrae

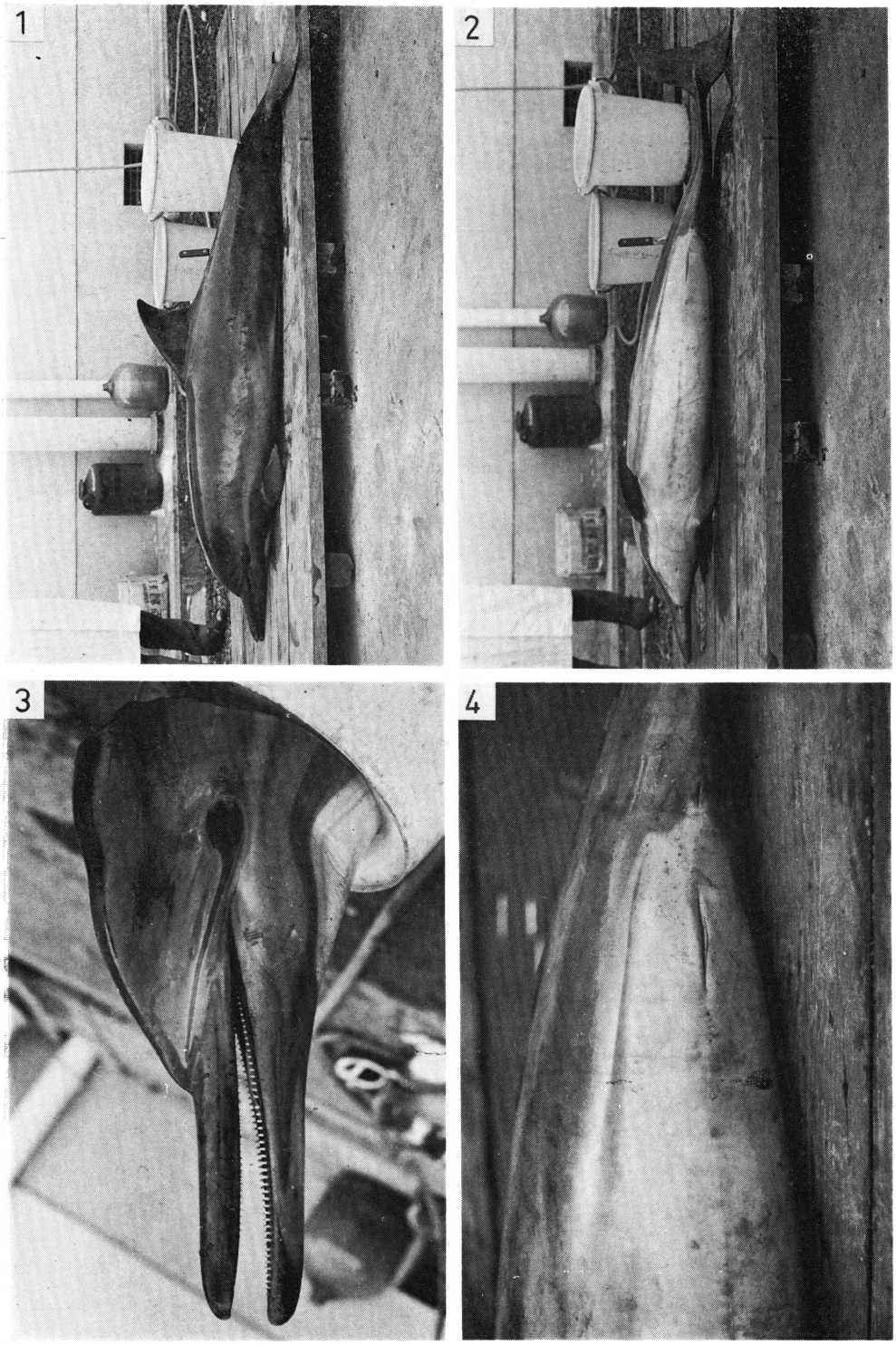

Plate I

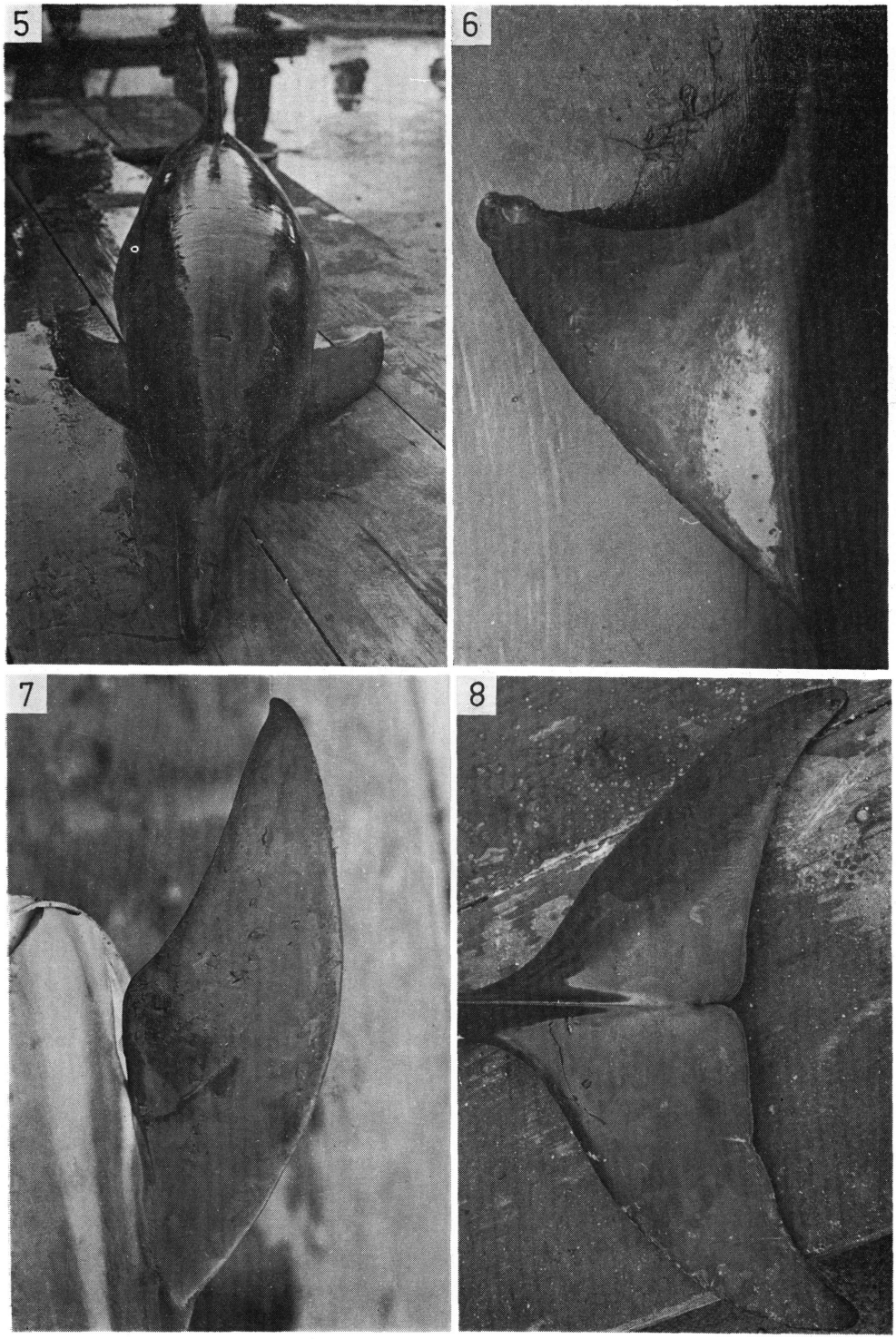

Plate II

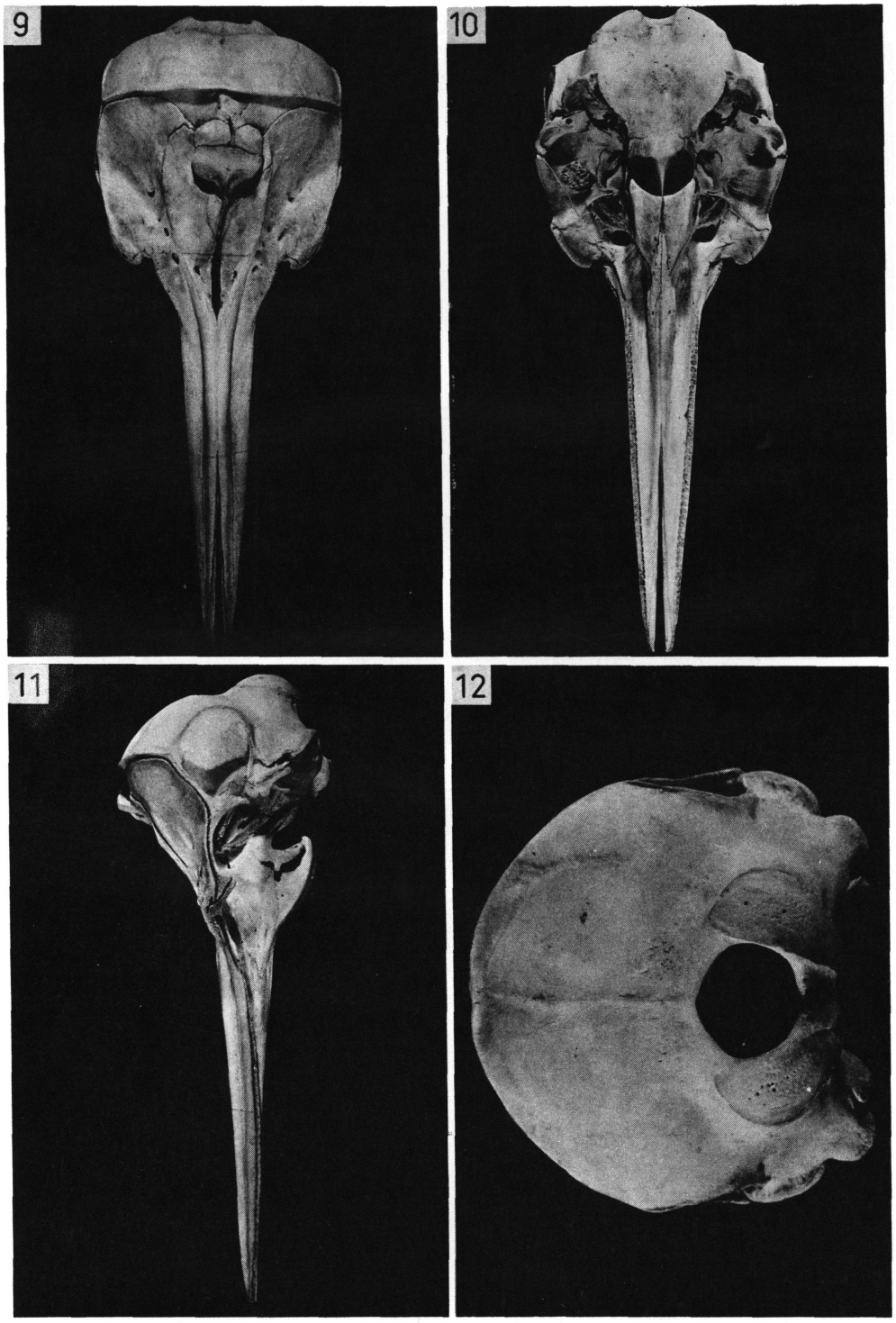

Plate III

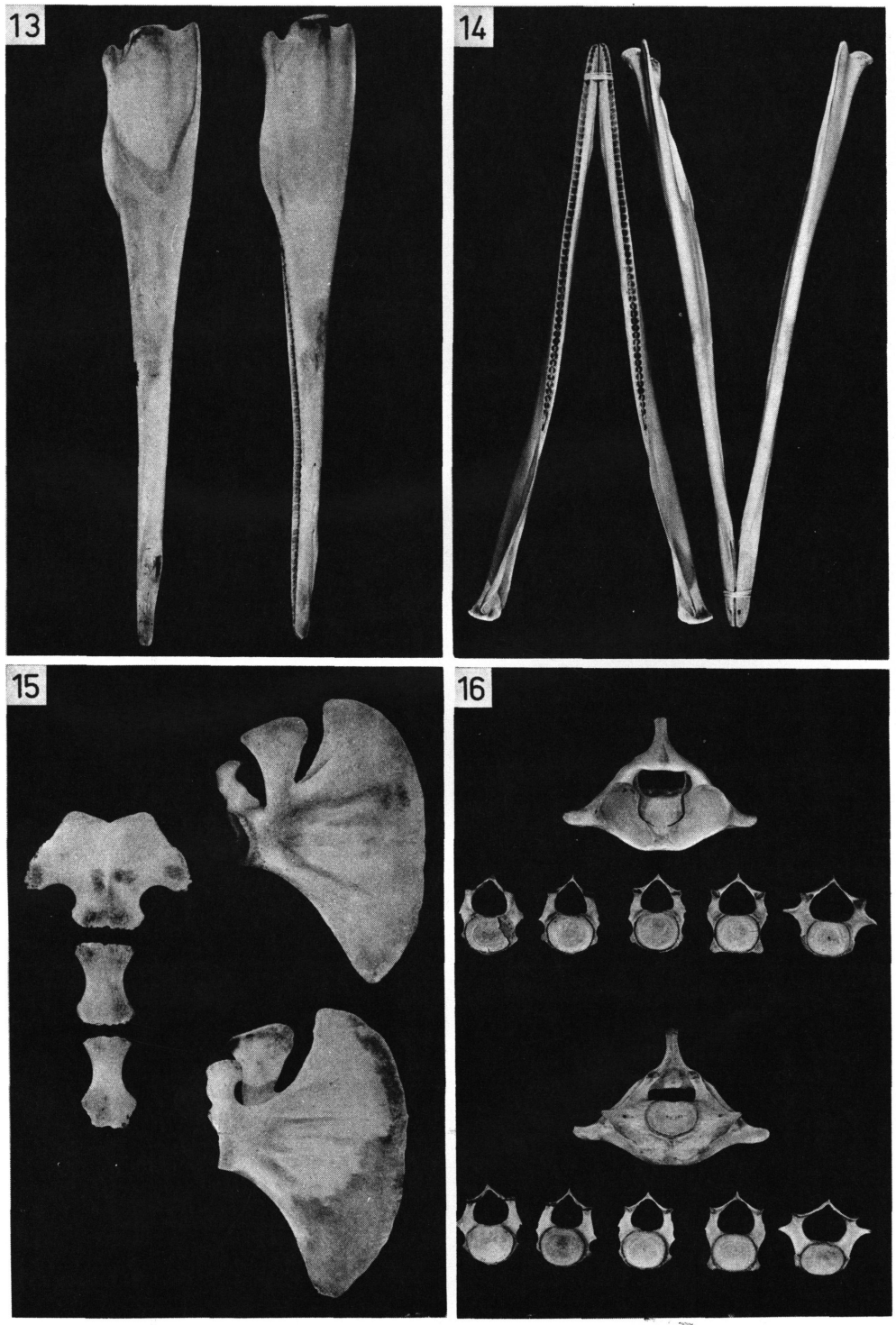

Plate IV