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THE FIRST RECORD OF A PYGMY KILLER WHALE *(Feresa attenuata)* FROM THAILAND

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ABSTRACT

A female pygmy killer whale, *Feresa attenuata*, 200 cm long, weighing 70.2 kg was stranded alive on April 1, 1996 at Chaomai Beach, Trang Province, Southern Thailand (7° 18′ 15″ N, 99° 24′ 30″ E). Standard body measurements and skull measurement were provided. The vertebral formula was C7 + D13 + L16 + Ca33 = 69, with 23 chevron bones. The first six pair of ribs were double-headed. The specimen was physically mature. The stomach contained no food remains, but only some nematodes and nematode cysts were collected near the ovaries. The complete skeleton was placed in the collection of Phuket Marine Biological Center. (Collection number PMBC11640).

INTRODUCTION

Twenty species of dolphins and whales belonging to six families have been recorded from Thailand based on caught specimens, stranded animals and skeletal evidence (Andersen and Kinze, 1995 ; Chantrapornsyl *et al.*, 1995) (Table 1).

The first record of a pygmy killer whale (*Feresa attenuata* Gray ,1875) from Thailand is a specimen stranded on the shore of Chaomai Beach, Sikow District, Trang Province on April 1, 1996. Chaomai Beach is located on the west coast of southern Thailand (7° 18′ 15″ N, 99° 24′ 30″ E), in an area belonging to National Park. Beyond the beach is shallow water with a wide sea grass bed covering the inner part of the bay. Many marine mammals live in this area. Previous strandings in the past few years on Chaomai Beach included three dugongs, two finless porpoises and one bottlenose dolphin.

The pygmy killer whale is widely distributed in tropical and warm subtropical waters world wide (Ross and Leatherwood, 1994). The species was first documented as occurring in the Indian Ocean, near the boundaries of the Indian Ocean Sanctuary (Leatherwood *et al.*, 1991). Leatherwood *et al.* (1991) reported the distribution of pygmy killer whale, based on a stranding specimen at Richard's Bay, South Africa. It was recorded by sighting west of Seychelles Bank in 1987 and off Lamalera,

Table 1. Dolphins and whales found in Thai waters.

Family	Scientific name
1. Balaenopteridae	*Balaenoptera physarus*
	Balaenoptera edeni
2. Physeteridae	*Physeter macrocepharus*
3. Kogiidae	*Kogia breviceps*
	Kogia simus
4. Ziphiidae	*Mesoplodon ginkgoden*
5. Delphinidae	*Orcinus orca*
	Pseudorca crassidens
	Globicephala macrorhynchus
	Peponocephala electra
	Sousa chinensis
	Tursiops aduncus
	Steno bredanensis
	Delphinus capensis
	Stenella longirostris
	Stenella coeruleoalba
	Stenella attenuata
	Orcaella brevirostris

Indonesia, in July and August 1979. Pygmy killer whales were sighted off Oman and two sightings in the Bay of Bengal, Northeast Sri Lanka. There is also evidence of 22 specimens at a Sri Lankan fish landing site. It is clear that the species is not rare in this region.

This report presents the external morphology, osteology and weight of the internal organs of this first specimen collected in Thailand.

MATERIALS AND METHODS

Most animals reported were stranded specimens and a few from bycatches. Hunting of dolphins and whales is prohibited in Thailand. Bycatches are usually released, but the dead animals have been utilized as fresh meat or salted by some villagers in the past. At present, consumption of marine mammals is illegal. This specimen was collected within the Marine Mammals of Thailand Research Project. It was transported to the Phuket Marine Biological Center for observation. The specimen was measured, weighed, photographed, and dissected. Measurements were made in a straight line from point to point, and body girths were measured with a cloth tape. Weight of the specimen was taken using a 200 kg lever scale. Stomach was searched for food remains and parasites. Other organs were checked for parasites. Ovary was observed for reproductive feature. Characters chosen for external measurements of the specimen were based on the work of Law (1994) and Van Waerebeek (1993).

Skeleton was removed, cleaned with water and placed in 5% H_2O_2 solution. Measurements of the skeleton and the number of bones were recorded, based on methods developed by Tinker (1988), Perrin (1975) and Yoshida *et al.* (1994). Skull and bone measurements used in this study are taken from Tinker (1988) and Perrin (1975). All linear measurements were taken with calipers to the nearest millimeter. Angle of asymmetry was measured with a protractor.

RESULTS

The live female pygmy killer whale was found stranding on the shore of Chaomai Beach, Trang province, on April 1, 1996. There was no sign of wounds on its body. National Park officials and some villagers tried to return it to the sea. A few hours later it was stranded on the shore again in a weakened condition. The National Park officials decided to keep it in a floating cage in front of the National Park. On April 2, 1996 a few small tuna (*Euthynnus affinis*) were fed to the whale, three tunas were eaten. Unfortunately, the whale died a few hours after eating the tuna. The specimen was presented to the Phuket Marine Biological Center (PMBC) and recorded as museum number PMBC11640.

External morphology

Descriptions of this specimen agree well with earlier descriptions of a pygmy killer whale, *Feresa attenuata* (Gray, 1875; Jefferson *et al.*, 1993; Tinker, 1988), by various characteristics including a slender body, a round head and the absence of a beak. It looks similar to a false killer whale and a melonheaded whale. The best characters for distinguishing between these three species are the shape of flippers and the number of teeth. Flippers that are curved and have round tips without humps on the leading edge are characteristic of a pygmy killer whale (pointed tips are found in melonheaded whales and humps on the leading edge in false killer whales). The body is generally black with white lips and a white patch is found around the genitals. There is a distinctive groove on the belly which begins anterior to the umbilicus and ends at the anus (Fig.1).

External measurements of this specimen are compared to measurements of 34 specimens from the Indian Ocean (Leatherwood *et al.*, 1991) and also 20 specimens reported by Ross and Leatherwood (1994) (Table 2). Living animals were seen at various locations during 1981-1984, and additional observations were made on 22 specimens between February 1983 and October

Table 2. Selected body measurements (in cm) of *Feresa attenuata* from Thailand compared to the 13 specimens from Sri Lanka (adapted from Leatherwood *et al.*, 1991) and Ross and Leatherwood (1994).

	This study		Sri Lanka		Ross and Leatherwood (1994)	
	cm	% TL	Range	% TL (average)	Range	% TL (average)
Total length (TL)	200.0	100.0	120.6-221.6	100.0	207.0-259.0	100.0
Snout to anus	135.0	67.5	83.8-148.6	M:64.1/F:66.9	-	-
Snout to genital slit	124.5	62.3	72.4-142.2	M:56.6/F:64.8	-	-
Snout to umbilicus	-	-	53.3- 99.1	43.0	-	-
Snout to post. base dorsal fin	117.0	58.5	-	-	-	
Snout to ant. base dorsal fin	88.0	44.0	55.9-124.5	49.4	-	-
Snout to blowhole	20.5	10.3	14.0- 25.4	11.6	15.0-25.0	9.6
Snout to angle of mouth	17.5	8.8	14.0- 21.6	10.0	-	-
Snout to eye	20.5	10.3	12.7- 26.7	11.8	18.0-28.0	10.2
Snout to ear	-	-	18.4- 33.0	15.2	-	-
Snout to ant. base of flipper	41.0	20.5	28.0- 44.5	20.6	38.5-53.5	19.6
Angle of mouth to ant. of eye	5.0	2.5	-	-	-	-
Basal length of dorsal fin	30.5	15.3	18.7- 50.8	19.0	32.0-51.0	16.8
Height of dorsal fin	23.6	11.8	12.7- 48.3	10.3	20.0-29.5	10.5
Body girth at						
post. base of dorsal fin	89.0	44.5	-	-	-	-
ant. base of dorsal fin	92.7	46.4	-	-	-	-
anal slit	54.8	27.4	-	-	-	-
Maximum breadth of mouth	16.0	8.0	-	-	-	-
Breadth of head at eye	24.5	12.3	-	-	-	-
Length of blowhole	1.1	0.6	-	-	-	-
Breadth of blowhole	3.5	1.8	3.8	1.5	-	-
Eye length	2.7	1.4	-	-	-	-
Breadth of fluke	51.8	25.9	35.6- 81.3	24.9	49.5-66.0	25.5
Depth of fluke	14.5	7.3	8.1- 35.6	7.2	-	-
Length of flipper,						
anterior insertion to tip	36.7	18.4	21.6- 45.7	19.3	40.0-50.5	21.1
posterior insertion to tip	28.0	14.0	16.5- 33.0	14.3	31.7-38.0	15.1
Greatest breadth of flipper	11.9	6.0	7.6- 20.3	6.3	13.0-16.3	6.5
Tooth count						
upper left/right	11/12	-	9-12/10-13	-	-	-
lower left/right	11/12	-	9-12/ 9-12	-	-	-

Table 3. Weights of selected internal organs (g) of *Feresa attenuata* from Thailand, compared to the data from Ross and Leatherwood (1994).

Organs	Thailand (this study)		Ross and Leatherwood (1994)	
	Weight (g)	% TW	Weight (range, n=7)	%TW (range)
Total weight (TW)	70.2 (kg)	100.0	110.0- 155.8 (kg)	-
Heart	350.0	0.5	502.0-1080.0	0.52-0.69
Lung	L900/R950	L1.28/R1.35	2420.0-4820.0	2.00-3.30
Liver	1100.0	1.6	1730.0-2820.0	1.35-2.00
Kidney	L250/R320	L0.37/R0.46	522.0- 675.0	0.36-0.57
Stomach	650.0	0.9	940.0-2600.0	0.85-1.67
Gonads	465.0	0.7		-

Figure 1. Pictures of the pygmy killer whale from Chaomai Beach, Thailand, showing shape, head and ventral groove.

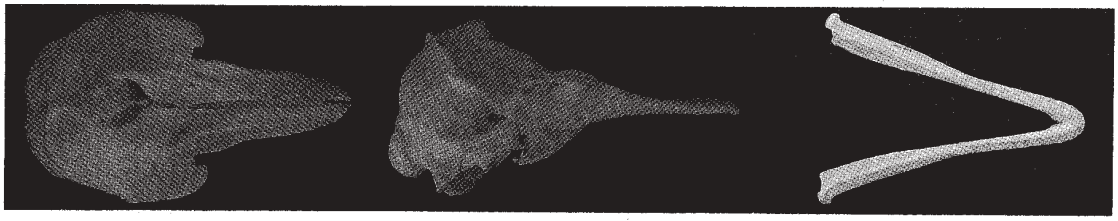


Figure 2. The skull and mandible of the pygmy killer whale from Thailand.

1985, at Sri Lankan fish-landing sites. These observations indicate that pygmy killer whales are present throughout the year in Sri Lankan waters.

Internal anatomy

Internal organs

The results of the dissection are shown in Table 3. There was no sign of damaged tissue or organs. The only food present in the stomach were three tunas that had been fed to it before it died. Length of the intestine was 15.28 cm. The weight of internal organs in Table 3 was compared to the data of Ross and Leatherwood (1994) which was provided from 7 *Feresa attenuata* specimens.

Parasites

A few nematodes were found in the stomach, and there were many cysts of unidentified

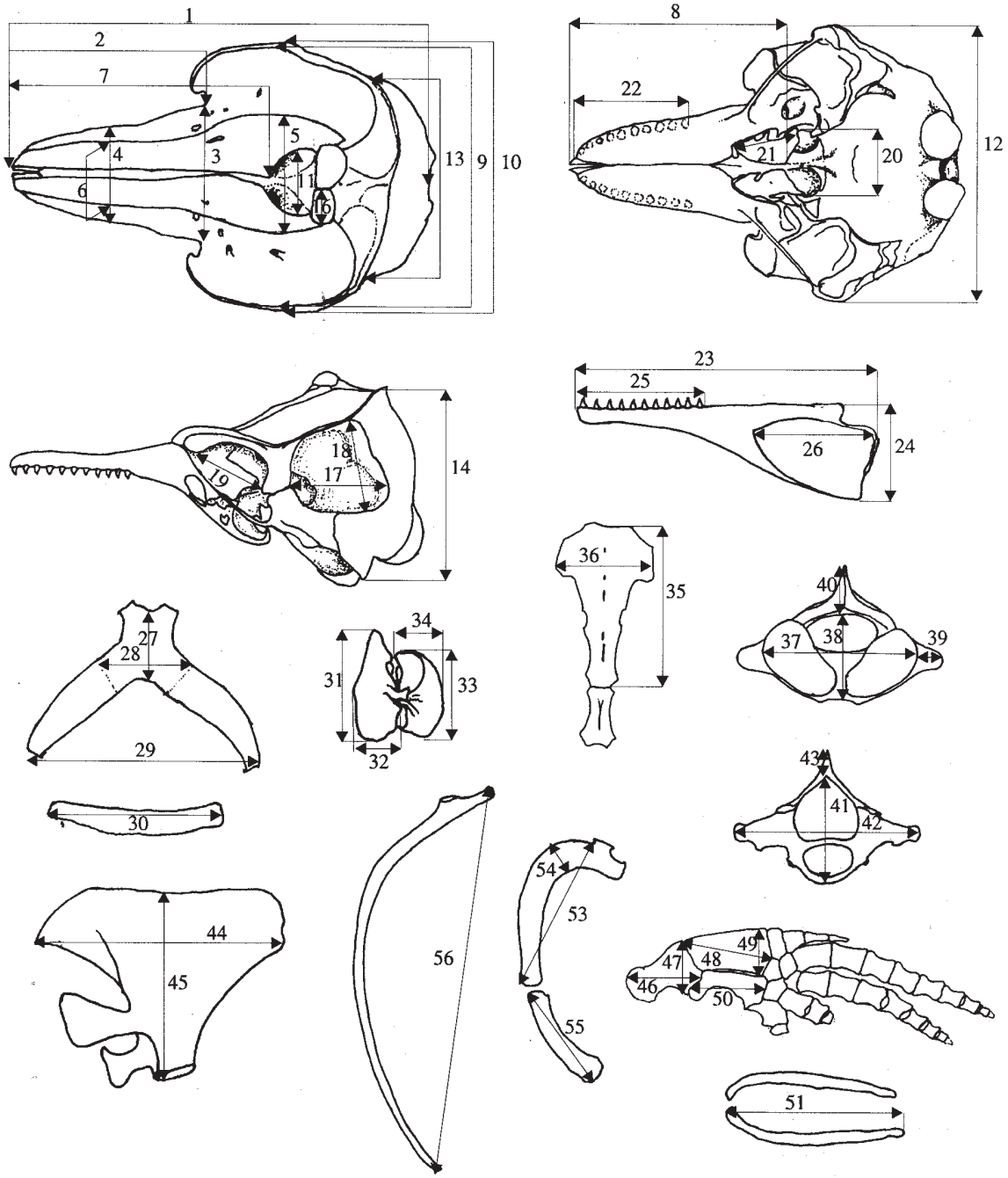


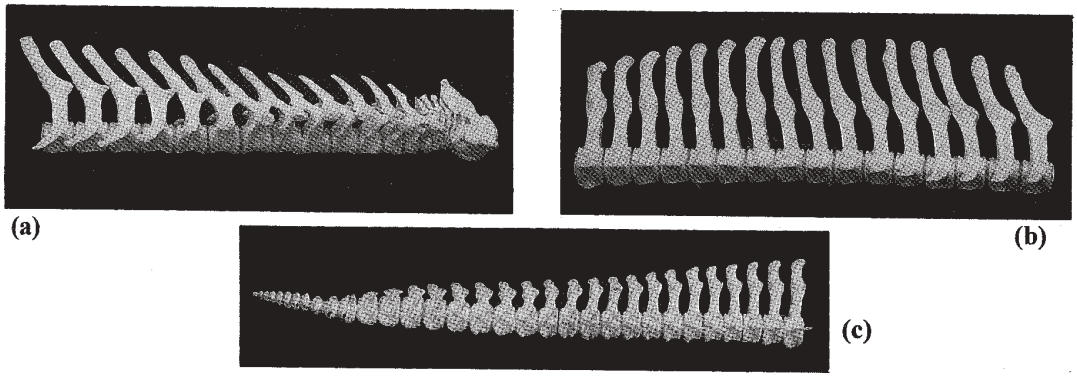
Figure 3. Measurements of cranium and other skeletons; Numbers refer to Table 4.

Table 4. Skeletal measurements of the pygmy killer whale, *Feresa attenuata*, from Thailand in comparison to the cranial measurements from Ross and Leatherwood (1994) (CL= condylobasal length).

Measurement	This study		Ross and Leatherwood (1994)	
	mm	% CL	mm (range)	% CL (average)
1. Condylobasal length	340	100.00	339-405	100.00
2. Length of rostrum	167	49.12	159-195	47.40
3. Width of rostrum at base	101	29.71	99-129	30.90
4. Width of rostrum at midlength	74	21.77	74- 97	23.80
5. Greatest width of premaxillae	89	26.18	87-107	25.00
6. Width of premaxillae at midlength of rostrum	51	15.00	-	-
7. Distance from tip of rostrum to external nares	215	6.32	-	-
8. Distance from tip of rostrum to internal nares	203	59.71	-	-
9. Greatest preorbital width	188	55.29	186-243	57.30
10. Greatest postorbital width	207	60.88	211-261	62.80
11. Greatest width of external nares	48	14.12	-	-
12. Greatest width across zygomatic process of squamosal	205	60.29	209-267	63.30
13. Width between parietals	147	43.24	-	-
14. Vertical external height of braincase	141	41.47	-	-
15. Internal length of braincase	110	32.35	-	-
16. Greatest width of left nasal	29	8.53	-	-
17. Greatest length of left posttemporal fossa	94	5.00	-	-
18. Greatest width of left posttemporal fossa at right angle	54	15.88	-	-
19. Length of orbit	79	23.24	-	-
20. Greatest width of internal nares	56	16.47	-	-
21. Greatest length of left pterygoid	74	21.77	-	-
22. Length of upper left tooth row	115	33.82	102-130	30.7
23. Greatest length of left ramas	262	77.06	269-309	77.6
24. Greatest height of left ramas at right angle	70	20.59	70- 93	22.1
25. Length of lower left tooth row	128	37.65	120-150	36.1
26. Length of left mandibular fossa	105	30.88	-	-
27. Length of basihyal along midline	38	-	-	-
28. Greatest width of basihyal	45	-	-	-
29. Greatest width between tip of thyrohyals	130	-	-	-
30. Greatest length of left styrohyal	81	-	-	-
31. Greatest length of left tympanic bulla	35	10.29	-	-
32. Greatest width of left tympanic bulla	23	6.77	-	-
33. Greatest length of left periotic	32	-	-	-
34. Greatest width of left periotic	25	-	-	-
35. Greatest length of sternum along midline	72	-	-	-
36. Greatest width of sternum	75	-	-	-
37. Greatest width of articulating surface of atlas	81	-	-	-
38. Height of atlas	54	-	-	-
39. Length of lateral process of atlas	20	-	-	-
40. Greatest length of neural spine of atlas	26	-	-	-
41. Height of first thoracic vertebra	57	-	-	-
42. Greatest width of first thoracic vertebra	91	-	-	-
43. Height of neural spine of first thoracic vertebra	12	-	-	-
44. Greatest length of left scapula	194	-	-	-

Table 4. Skeletal measurements of the pygmy killer whale, *Feresa attenuata*, from Thailand in comparison to the cranial measurements from Ross and Leatherwood (1994) (continued).

Measurement	This study		Ross and Leatherwood(1994)	
	mm	% CL	mm (range)	% CL (average)
45. Greatest width of left scapula	135	-	-	-
46. Greatest length of humerus	64	-	-	-
47. Greatest width of humerus distally	48	-	-	-
48. Greatest length of radius	85	-	-	-
49. Greatest width of radius distally	43	-	-	-
50. Greatest length of ulna	78	-	-	-
51. Greatest length of left pelvic bone	116	-	-	-
52. Greatest width of left pelvic bone	9	-	-	-
53. Greatest length of first left vertebral rib	14	-	-	-
54. Greatest width of first left vertebral rib	24	-	-	-
55. Greatest length of first sternal rib	86	-	-	-
56. Greatest length of longest vertebral rib	282	-	-	-



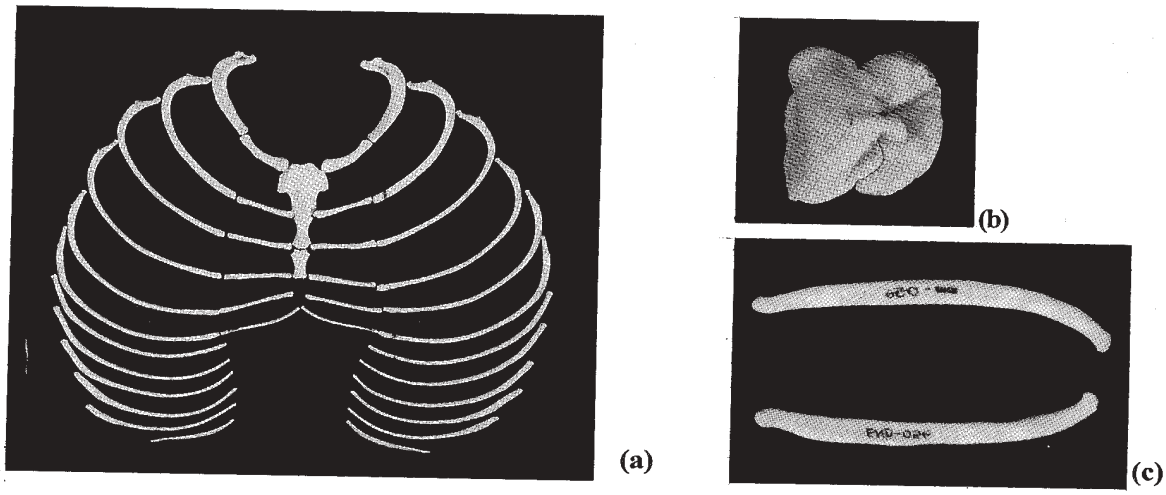
Figures 4a-c. Skeleton of the present specimen **a)** 1-7 cervical vertebrae (1-3 fused) and 1-13 dorsal vertebrae **b)** 1-16 lumbar vertebrae and **c)** 1-33 caudal vertebrae.

nematodes found between the peritonial membrane around the ovaries. These parasites have been preserved in 10% formalin for future identification.

Skeleton

The skull is markedly asymmetrical, the deviation of the skull from symmetry in dorsal view is 10 degrees to the left. The rami of mandible are fused together. Characteristics of skull and mandible are shown in Figure 2, and selected measurements on skull and bones are shown in Table 4. The techniques used to measure the skeleton are illustrated in Figure 3. The upper jaw had 10 teeth on each side, 1 was missing on the left and 2 were missing on the right upper jaw.

The vertebral formula was C7 + D13 + L16 + Ca33, with a total of 69 vertebrae. The vertebrae are illustrated in Figure 4. None of epiphysis bones are separated. It is a physically mature animal. The first three cervical vertebrae are fused, while the last four are separate individuals. The basihyal and thyrohyals are fused into a Y shaped. There are 13 pairs of ribs (Fig. 5) and the first six pairs have



Figures 5a-c. a) 13 pairs of ribs of the present pygmy killer whale **b)** the left tympanoperiotic bone and **c)** the pelvic bones.

double articulation. There are 22+ chevron bones (one or two were missing). The sternum consisted of a larger presternum or manubrium, and two smaller mesosternal segments; the manubrium and first mesosternum are fused. There are 6 pairs of sternal ribs. The 69 vertebrae conform to the pygmy killer whale description by Tinker (1988), and the 67-70 from Ross and Leatherwood (1994). Length of the left pelvic bone was 116 mm and the weight was 2 g.

DISCUSSION

The pygmy killer whale had not been found or recorded in Thai waters before this report. This species is one of the rarest marine mammal species in the world. A review of world records is found in Ross and Leatherwood (1994), the only other Southeast Asian records appear to originate from Lembala, Indonesia (Hembree, 1980). Dayaratne and Joseph (1993) reported a total of 1,791 dolphins and whales landed at 14 fish landing sites in Sri Lanka during September 1991 and September 1992. Fifty pygmy killer whales (1.8% of total landed animals) were recorded within one year. The maximum recorded length of pygmy killer whale was 270 cm, and its length at birth was 100 cm based on the Sri Lankan specimens. Perrin and Hubbs (1969) described a newborn pygmy killer whale from Costa Rica 82.2 cm length.

This specimen was 200.5 cm in length and its weight was 70.2 kg. The weight was suspiciously light when compared to the specimens of Ross and Leatherwood (1994) (over 100 kg in neary similar sized animals). This specimen had a slim body, and may have been starving for a long time before it was stranded.

The Andaman Sea of Thailand is a good fishing ground for tuna, and is an important feeding area for many oceanic species of marine mammals, including *Mesoplodon ginkgoden, Kogia simus, Kogia breviceps* and *Steno bredanensis* which have been recorded previously in Thai water.

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REFERENCES

Andersen, M. & C.C. Kinze. 1995. Annotated checklist and identification key to the whales, dolphins and porpoises (Order Cetacea) of Thailand and adjacent waters. Paper reported to the Workshop on Small Cetaceans of Thailand. Phuket Marine Biological Center, Phuket. 18 p.

Chantrapornsyl, S., K. Adulyanukosol & K. Kittiwatthanawong. 1995. Study on dolphins and whales in Thailand. **In**: Proceeding of the Seminar on Fisheries, 1995, pp. 155-164. Department of Fisheries, Bangkok (in Thai).

Dayaratne, P., & L. Joseph. 1993. A study on dolphin catches in Sri Lanka. Bay of Bengal Programme. BOBP/REP/56. 47 p.

Hembree, E.D. 1980. Biological aspects of the cetacean fishery at Lamalera, Lembata. Final report on WWF project 1428. 55 p.

Jefferson, T.A., S. Leatherwood & M.A. Webber. 1993. *Marine Mammals of the World.* United Nations Environment Programme. FAO, Rome. 320 p.

Law, R.J. 1994. Collaborative UK Marine Mammal Project: Summary of data produced 1988-1992. *Fisheries Research Technical Report.* **97**: 42 p.

Leatherwood, S., D. McDonald, W.P. Prematunga, P. Girton, A. Ilangakoon & D. McBrearty. 1991. Recorded of the "Blackfish" (Killer, False Killer, Pilot, Pygmy Killer and Melonheaded whales) in the Indian Ocean, 1772-1986. **In:** S. Leatherwood and G.P. Donovan (eds.) *Cetaceans and Cetacean Research in the Indian Ocean*, pp. 33-65. Black Bear Press Limited. Nairobi, Kenya.

Perrin, W. F. 1975. Variation of spotted & spinner porpoise (Genus *Stenella*) in the Eastern Tropical Pacific and Hawaii. *Bull. Scripps Inst. Oceanogr.* **21**: 206 p.

Perrin, W. & C.L. Hubbs. 1969. Observations on a young pygmy killer whale (*Feresa attenuata* Gray) from the Eastern Tropical Pacific Ocean. *Transactions of the San Diego Society of Natural History*. **15**(3): 295-308.

Ross, G.J.B. & S. Leatherwood. 1994. Pygmy killer whale *Feresa attenuata* Gray, 1874. **In:** S.H. Ridgway and R. Honison (eds.). *Handbook of Marine Mammals,* Vol. **5,** pp. 387-404. Academic Press Limited, London.

Tinker, S.W. 1988. *Whales of the World.* Bess Press Inc., Honolulu, HI96822. 310 p.

Van Waerebeek, K. 1993. External features of the dusky dolphin *Lagenorhynchus obscurus* (Gray, 1828) from Peruvian waters. *Estudios Oceanologios*. **12**:37-53.

Yoshida, H., M. Shirakihara, A. Takemura & K. Shirakihara. 1994. Development, sexual dimorphism, and individual variation in the skeleton of the finless porpoise, *Neophocaena phocaenoides*, in the coastal waters of Western Kyushu, Japan. *Marine Mammal Science*. **10**(3): 266-282.