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Postmortem findings in stranded Harbour Porpoises (*Phocoena phocoena*, L.1758) in The Netherlands from 23rd March 1983 to 25th June 1986

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Summary

The post-mortem findings in 38 stranded harbour porpoises during the period 23rd March 1983 to 25th June 1986 in The Netherlands results in a general view about the parasitological status and the organic diseases in these animals. The observations concur with those in caught animals described by Andersen (1978) and by Clausen & Andersen (1988).

The observations (3 ×) of roundworms in the skull sinus around the equilibrium organ may be a signal for further investigations in this part of the body.

Introduction

The first report concerning the post-mortem findings in harbour porpoises is from Anderson (1978). He studied the mortality, autopsy findings and influences of the captive environment in harbour porpoises. His animals constituted a normal random sample of the population.

In the present study the results of the gross post-mortem examination in thirty-eight harbour porpoises washed up on the Dutch beach will be described. The results will be compared with Anderson's findings.

The study finds its limits in: 1. The state of decomposition of the body and its organs. (Thirty-three per cent of all stranded animals are suited for post-mortem examination); 2. lack of finance makes only gross examination possible; 3. a lack of knowledge concerning the influence of diving on the organs and 4. the requirements for parts by other interested scientists, for instance the skull and its adnexa for quantitative analysis of the bones.

Material and techniques

During the period 23rd March 1983 to 25th June 1986 post-mortem examinations have been performed on thirty-eight harbour porpoises with a size between 95 and 170 cm and in two full time foetuses. Table 1a and 1b displays the size of the animals and the findings.

All post-mortem examinations have been performed with organoleptic means as: naked eye, smell and tactile observations.

The sequence used of the examination is: Inspection of the outside including the mouth opening, the eyes, the umbilicus, the external genital organs, the mammary glands and the anus. The cadaver lies during the dissection on its right side. The internal inspection is possible after removal of the left side of the body from the first rib to the caudal end of the abdomen. The position of the diaphragm remains intact. Visual inspection and palpation of the organs follows. Special attention is given to the pleurae and the peritoneum. The organs are taken out in the next sequence: left lung, heart with pericardium and roots of the large arteries, right lung, liver, stomach and oesophagus, intestines, adrenals and kidneys, urinary bladder and the reproduction organs. The great arteries—thoracic and abdominal Aorta, both the caval veins—are inspected and opened.

The condition of the muscles, the blubberlayer and some of the opened joints—occipital and humeral—are inspected in the last phase of the post-mortem inspection.

The skull is dissected in cases of unknown origin only, and after embalming—hardening—of the brains by intravenous injection with 4% formaldehyde.

Results

The results are listed in the tables 1a and 1b.

Comment

Nine cases—listed in the tables—ask for some further comment. The bad condition of an animal caused by diseased organs may be the actual inducement for death by exhaustion. These conditions are: Malnutrition and cachexia (3); purulent inflammation of the right testis (38); purulent inflammation of the kidneys and ureters with development of abscesses (29); abscesses in the spinal column (10);

Table 1a Parasitological status and organ pathology in female harbour porpoises

Nr	Size in cm	Lu	Li	St	In	Para. stat.	Organ pathology
1	93						neonatal heart, patent for. oval. & duct. art.
2	102						
3	110						malnutrition & cachexia
4	118						
5	118						heart, erratic orig. acs & aplasia r. circ. acs
6	118				T^{++}_{+}		
7	120						
8	128						
9	137	R+					
10	142						abscesses lungs & spinal column
11	147	R+	F+			+/−	abscesses left flipper
12	159	R^{++}_{+}	F++	R++	R++	+	
13	164	R++	F++			+	endometritis
14	166	R^{++}_{+}	F^{++}_{+}	R^{++}_{+}	R++		
					T^{++}_{+}	+	
15	167	R++	F++			+	
16	167	R^{++}_{+}		R^{++}_{+}		+	ulcers skin & stomach
17	168	R++	F++	R^{++}_{+}		+	broken jaw
18	170	R++	F++			+	
19	?						
20	?	R+	F+	R+		+/−	ulcers stomach
21	?						
22	?	R+	F+				
23	?	R+					

plus one female foetus, no post-mortem findings

skin and stomach ulcers (16); abscesses and cavities in the lungs, pericarditis and infarction of the heart (27); stomach ulcers (20, 37) and abscesses in the kidneys (26).

In this range five out of nine cases display purulent foci and abscesses, in one case emaciation and cachexia were the single findings, while in another case the infarction of the heart was the leading observation.

Pneumonia occurs in the listed cases always together with a lungworm infestation, so it is likely that the parasites cause the pneumonia (Clausen & Andersen, 1988).

The skull was dissected in three cases only. An abundant infestation of hairworms was observed in the sinus around the organ of equilibrium in these cases. The cause of stranding may be the loss of equilibrium.

Neither pathological nor parasites have been observed in the two full time fetuses. The observed patency of the foramen ovale and the ductus arteriosus may be considered as physiological.

It is striking, that no cases of death by drowning have been observed. However to diagnose 'death by drowning' is rather difficult with macroscopical techniques only, so this diagnosis is not listed at all.

Drowning will happen mostly in fishermen's nets, so harbour porpoises with no or slight post-mortem findings may be caught in nets first and will then drown. They are thrown overboard later. On the other side ill animals may be caught easily and drowned too. It is the author's opinion, that drowning characteristics are not easy to separate from marked post-mortem findings.

The cases of purulent foci and abscesses are difficult to integrate in the post-mortem findings. A primary infection with bacteria is acceptable in the genital organs and the mammary glands but questionable in other organs. Purulent foci and abscesses in lungs, liver, kidneys and the spinal column may be caused by circulating parasite larvae in the blood. These findings are well known in cattle and horses (Ostertag & Schönberg, 1955; Nieberle & Cohrs, 1952), it seems likely, that it is the same in small cetaceans with a parasitic infestation.

The pathogenic influence of the tape worm infestation in the intestines is yet not clear, an infestation without clinical symptoms is possible.

Table 1b Parasitological status and organ pathology in male harbour porpoises

Nr	Size in cm	Lu	Li	St	In	Para. stat.	Organ pathology
24	60						neonatal heart, patent for. oval. & duct. art.
25	95						carcass
26	103	R$^{+}_{\pm}$				+	abscesses kidney
27	113	R$^{+}_{\pm}$				+	heart infarction & pericarditis & abscesses. lungs
28	142	R++	F++			+	
29	143	R+	F+			+/−	inflammation & abscesses, kidney and r. ureter
30	145						
31	146	R++	F++			+	heart, aplasia orig. acs, infarction
32	147	R+	F+		T+		
33	155						cachexia
34	157	R++	F$^{+}_{\pm}$			+	abscesses prostate gland
35	157	R+	F+	Li+		+/−	heart aplasia orig. acs
36	?	R$^{+}_{\pm}$	F$^{+}_{\pm}$			+	
37	?	R+	F+			+/−	ulcers stomach
38	?	R++	F++			+	cachexia & abscesses right testis

plus one male foetus, no post-mortem findings

Legends to Table 1a and 1b

Nr: number
Lu: lungs
Li: liver
St: stomach
In: intestines
R: round worms
F: flukes
T: tape worms
$\pm$: light infestation
++: moderate infestation
$^{+}_{\pm}$: heavy infestation
Para. stat.: parasitological status
+: important
+/−: moderate important
acs: arteria coronaria sinistra
duct. art.: ductus arteriosus
for. oval.: foramen ovale
orig.: origin

The similarity of stomach ulcers and worms is evident, the aetiological relation is still unknown.

The observations make it likely, that the infestation with parasites starts after weaning and with the consumption of fish. This concurs with the accepted role of the fishes within the life cycle of the parasites.

Anderson (1978) found five times—in a restricted number of five animals which died during transport—a chronic pulmonary heart disease similar to lung worms infestation. In these animals two cases of non-parasitic lesions were present too—dermatomycosis. These observations concur with three cases out of the presented one (12, 14 and 16). He observed in a second group of twenty five animals, which lived and died in a captive environment, a rather high number of worm infestations. Since he did not list the animals together with the diseases, but the diseases only, the number of specific attacked animals remains unknown. Registered non parasitic diseases are: perinatal death, drowning, starving, abortion, kyphose and unknown. The worm infestations in these animals don't differ widely from the presented ones.

Comparing the present findings with those observed by Anderson the author states, that the stranded animals presented in this communication display in their pathology a great similarity with Anderson's observations in both groups. The stress during transport caused the death in already sick animals and so did the stress caused by the stranding or by the catching in fishermen's nets.

Conclusions

Some of the stranded harbour porpoises in The Netherlands in the period 23rd March 1983 to 25th June 1986 have been sick before the stranding. The stress of this impact caused the death of these animals. The bulk of the animals displayed the parasitological status of a carrier with diseases compatible with a quiet life.

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