

# Presence of Cetacean Species and Relatives Cause of Death In the Italian Waters (2001-2006)

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## Abstract

The Mediterranean Marine Mammals Tissue Bank (MMTB) was established in Padova with the official recognition of the Italian Ministry of the Environment within the ACCOBAMS agreement. It cooperates with National Stranding Networks and other Institution, as the Museum of Natural History of Milan, to collect tissue samples from cetacean stranded along Italian coastlines and close Mediterranean Sea, performing complete post-mortem examination whenever it was possible. Between 2001 and 2006, samples from 109 animals were collected and stored on 712 registered strandings. Data on species, animals and pathological findings are herein discussed.

## The Mediterranean marine mammal tissue bank

The Mediterranean marine mammal tissue bank (MMTB), established in Padova (Italy) with official recognition and funding from the Italian Ministry of Environment within the ACCOBAMS agreement, collects tissue samples from cetaceans stranded along the Italian coastline or in adjacent Mediterranean areas. Tissues are prepared and stored by the MMTB to be delivered to scientists dealing with marine mammals of the area.

## Stranding network organization in Italy

Strandings in Italy are monitored by a number of organizations acting under no specific governmental regulation. The largest organizations, named Centro Studi Cetacei - Onlus (CSC) and Fondazione Cetacea respectively, publish yearly detailed reports of the strandings in which they were involved. Anecdotal evidences suggest that an additional number of animal strands unnoticed or is taken care by local environmental health agencies that do not diffuse data pertinent to the strandings. The Museum of Natural History of Milan (MNHM), a recognized *super partes* Institution, receives data on strandings from the different agencies and is currently preparing a common national stranding database in cooperation with researchers from the University of Pavia.

Tissue sampling and delivery to the MMTB is by no means mandatory. However a significant percentage of stranded animals are brought to the attention of the MMTB, either as a whole carcass or as a number of samplings. These animals, or their bodily parts, are examined by a team of competent pathologists.

## Samples received

During the period 2001- 2006 the MMTB received the whole body or specimens from 109 marine mammals, 96 of which cetaceans from the Mediterranean Sea belonging to the following species: *Balaenoptera physalus* (# 1), *Physeter macrocephalus* (# 1), *Kogia sima* (# 1), *Ziphius cavirostris* (# 4), *Mesoplodon europaeus* (# 1), *Globicephala melas* (# 1), *Grampus griseus* (# 7), *Tursiops truncatus* (# 41), *Stenella coeruleoalba* (# 34), *Delphinus delphis* (# 3), *Steno bredanensis* (# 2). Based on the number of stranding officially notified to the Museum of Natural History of Milan during the period 2001-2006 (total # 712,), the

number of individuals referred (as a whole or as tissue sample) to the MMTB represents the 13.5 % of the total.

### **Cetaceans of the Mediterranean sea**

Data harvested from the MMTB confirm that the bottlenose, striped and Risso's dolphin are commonly present in the Mediterranean waters adjacent to the Italian territory. Larger species, including the fin whale, sperm whale and Cuvier's beaked whale, are thought to be relatively common in the Tyrrhenian Sea, based on sightings at sea. However fin and sperm whales seldom strand in the area, and can not be adequately accounted for in the MMTB. The common dolphin, once a well-known occurrence, is now a rare species whose presence is severely endangered. The other species listed are well known - although not always common - inhabitants of the Mediterranean, with the exception of the Gervais' beaked whale, whose stranding along the coasts of Tuscany in 2001 was the first reported in the area.

### **Pathological findings**

In most instances, a cause of death could not be established based on the samples received by the MMTB. Reasons for this include insufficient data attached to the samples received, poor body condition or simply inconclusive findings. On the other hand, when a whole animal was received, or when the death of the animal was notified timely enough to allow a team of pathologist to reach the place of stranding, a probable cause of death was recorded. Only 22 of the stranded cetaceans received from the MMTB underwent a detailed postmortem (22,9%; 3% of the cetaceans stranded along Italian Coastlines reported by MNHM) examination and in 7 cases, the gross investigation was performed by veterinarians belonging to other institutions. On tissues from remaining 74 animals, only a partial microscopic study was possible.

The main pathological finding observed during necropsies was pneumonia frequently associated with respiratory and/or extra-pulmonary parasites. This observation agrees with previous data reported in literature (Di Guardo et al., 1995; Cornaglia E. et al, 2000).

### **Causes of death**

A certain cause of death was assessed in 13 subjects (59% of the examined cases) and in most of the cases an infective agent or infections-related changes played a fundamental role in the stranding event. Only in one striped dolphin a human activity was likely related to the death of the animal. In table 1, cause of death/stranding are listed and, in undetermined cases, remarkable pathological findings are summarized. In spite of the fact that pneumonia associated with parasitosis was a frequent lesion, it was not possible to recognize a single disease and/or conditions as the primary common cause of the different stranding episodes investigated herein.

*Table 1: Cause of death/strandings and significant pathological findings of the investigated animals*

<b>Species</b>	<b>Cause of death/strandings</b>	<b>Notes/important findings</b>	<b>Necropsy performed by MMTB</b>
Short-beaked common dolphin ( <i>Delphinus delphis</i> )		- Heterotopic renal tissue in the lung - Vaginal calculus	Y
Common bottlenose dolphin ( <i>Tursiops truncatus</i> )		- Multiple abscesses in the melon - Oral fibropapilloma	Y

Striped dolphin ( <i>Stenella coeruleoalba</i> )			Y
Striped dolphin ( <i>Stenella coeruleoalba</i> )	Severe acute necrotizing pancreatitis and severe multifocal adrenal gland necrosis		Y
Dwarf sperm whale ( <i>Kogia sima</i> )	Disseminated Intravascular Coagulation (DIC)		N
Striped dolphin ( <i>Stenella coeruleoalba</i> )	Infection by <i>Photobacterium damsela</i> and severe parasitosis		Y
Striped dolphin ( <i>Stenella coeruleoalba</i> )		- Severe ecto- and endo-parasitosis - Moderate emaciation	Y
Striped dolphin ( <i>Stenella coeruleoalba</i> )			N
Steno ( <i>Steno bredanensis</i> )		- Chronic adrenalitis and thyroiditis	N
Striped dolphin ( <i>Stenella coeruleoalba</i> )	Disseminated Intravascular Coagulation (DIC)		N
Long-finned pilot whale ( <i>Globicephala melas</i> )		- Plastic bags and fishing lines in gastric concamerations	N
Risso's dolphin ( <i>Grampus griseus</i> )		- Retro peritoneal peri-urethral multiple air-filled cysts - Hepatic glycogenosis	Y
Common bottlenose dolphin ( <i>Tursiops truncatus</i> )	Severe hydrocephalus secondary to chronic granulomatous multifocal mycotic meningoencephalitis due to <i>Cladosporium</i> sp.		Y
Risso's dolphin ( <i>Grampus griseus</i> )		- Urinary calculi - Focal arteriosclerosis in the aorta.	N
Risso's dolphin ( <i>Grampus griseus</i> )	Systemic mycosis and septicemia.		N
Common bottlenose dolphin ( <i>Tursiops truncatus</i> )	Heart failure due to chronic myocardial infarct		Y
Risso's dolphin ( <i>Grampus griseus</i> )		- Severe lipofuscinosis with severe astrogliosis and adrenocortical nerves sheaths enlargement (16 years old)	Y

Common bottlenose dolphin ( <i>Tursiops truncatus</i> )	Cerebral abscess on the left occipital region		Y
Common bottlenose dolphin ( <i>Tursiops truncatus</i> )	Uremic syndrome due to renal failure.		Y
Fin whale ( <i>Balenoptera physalus</i> )	Heart failure due to left granulomatous myocarditis		Y
Common bottlenose dolphin ( <i>Tursiops truncatus</i> )	Respiratory failure due to massive parasitic pneumonia		Y
Common bottlenose dolphin ( <i>Tursiops truncatus</i> )	Septicemia due to <i>Aeromonas hydrophyla</i>		Y
Striped dolphin ( <i>Stenella coeruleoalba</i> )	Penetrating wound on the right jaw, possibly by a hook		Y

Di Guardo ,G., Agrimi, U., Morelli, L., Cardeti, G., Terracciano, G. and Kennedy, S., 1995. Post mortem investigations on cetaceans found stranded on the coasts of Italy between 1990 and 1993. Vet. Rec. 136(17): 439-42.

Cornaglia, E., Rebora, L., Gili, C., Di Guardo, G., 2000. Histopathological and immunohistochemical studies on cetaceans found stranded on the coast of Italy between 1990 and 1997. J. Vet. Med. A. Physiol. Pathol. Clin. Med. 47(3): 129-42.