Stranded cetaceans as sentinels for those living in the open sea

Cetacean strandings, coupled with the study of their causative factors, are a matter of rapidly growing scientific interest and debate. Within such context, “beached” cetaceans undoubtedly represent a crucial source of “vital informations”, provided that dolphins’ and whales’ strandings, either single or mass strandings, paradoxically are one of the few, if not even the only chance, to “get in touch” with these fantastic, highly vulnerable and worldwide threatened animals. Indeed, “stranded cetaceans” may be regarded as key-indicators, or “sentinels”, of the health and conservation *status* of their “cospecifics and heterospecifics” living in the open sea and, to a wider extent, also of the “health and conservation of the marine environment” as well as of “human health”. Among the many, hitherto recognized threats to which free-ranging cetaceans are exposed, many of them are of human origin, as in the well-known examples of “by-catch”, ship collisions and noise, mid-frequency sonar waves and chemical sea pollution. Furthermore, a number of “natural” causes have been identified, throughout the last decades, as capable of seriously impacting the health and conservation *status* of free-living cetaceans (and pinnipeds) worldwide. A highly paradigmatic example in this direction is represented by *Morbillivirus* infections. As a matter of fact, in the last 25-30 years at least 10 distinct morbilliviral epidemics have occurred among several free-ranging pinniped and cetacean populations and species throughout the world, including the dramatic outbreak which occurred between 1990 and 1992 among Mediterranean striped dolphins, followed 15 years later by a less severe mortality event in the same area. Apart from *Morbillivirus*, *Toxoplasma gondii* and *Brucella* spp. represent two additional pathogens seriously threatening the health and conservation of free-ranging cetaceans, being also characterized, at the same time, by a documented zoonotic capability. This means that both agents may induce human infection, sometimes with devastating effects, as in the cases of “neurobrucellosis” reported in patients exposed to *Brucella* spp. strains of “marine” origin.

It becomes of strategic relevance, therefore, to assess whether free-ranging cetaceans have been exposed to the three aforementioned pathogens and this has been the main objective of a recent Italian study, published by Dr Francesca Profeta and coworkers in the international Journal *Research in Veterinary Science* and involving several Scientific Institutions, all of which belonging to the “*Network for the Epidemiologic and Health Surveillance of Cetaceans Stranded Along the Italian Coastline*”, which was created in 2010 under the joint-supervision of the Italian Ministry for the Environment and of the Italian Ministry of Health. The authors of this original work, which was financially supported by the Italian Ministry for the Environment and was headed by the Faculty of Veterinary Medicine of the University of Teramo through its scientific team supervisor, Prof. Giovanni Di Guardo, investigated the blood serum samples collected from 70 cetacean specimens found stranded along the Italian coastline between 1998 and 2014. A total number of 23 samples (32.8%) obtained from striped dolphins, bottlenose dolphins, fin-whales and long-finned pilot whales (all *Morbillivirus*-susceptible species) harboured anti-*Morbillivirus* neutralizing antibodies, while 10 sera (16%) collected from striped dolphins and bottlenose dolphins were found positive

against *Toxoplasma gondii*. On the contrary, no antibodies against *Brucella* spp. were detected in any sample. These data, while providing further support to the likely prolonged and long-lasting circulation of *Morbillivirus* and *Toxoplasma gondii* among Mediterranean cetaceans, differently from what concerns their presumably much more recent exposure to *Brucella* spp., once again underscore the paramount relevance of stranded animals for monitoring the health *status* of free-ranging cetaceans as well as for investigating the level of their exposure to selected infectious agents representing a serious threat for aquatic mammals.

Publication

Retrospective seroepidemiological investigations against Morbillivirus, Toxoplasma gondii and Brucella spp. in cetaceans stranded along the Italian coastline (1998-2014).
Profeta F, Di Francesco CE, Marsilio F, Mignone W, Di Nocera F, De Carlo E, Lucifora G, Pietroluongo G, Baffoni M1, Cocumelli C, Eleni C, Terracciano G, Ferri N, Di Francesco G, Casalone C, Pautasso A, Mazzariol S, Centelleghe C, Di Guardo G
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