

KILLER WHALE (*ORCINUS ORCA*) DIET IN THE STRAIT OF GIBRALTAR

Gallego, Pierre (1, 2, 5), Andréu, Ezequiel (2, 3), Morales, Aurelio (1), Cosentino, Andrea (4),
Lott, Rob (5), Scullion, Andrew

(1) Turmares Tarifa, Tarifa, Cádiz, Spain; (2) National Museum of Natural History, G-D of Luxembourg; (3) Departamento de Biología, Facultad de Ciencias del Mar y Ambientales, Universidad de Cádiz, Cádiz, Spain; (4) Asociación Inachus, Málaga, Spain; (5) WDCCS, the Whale and Dolphin Conservation Society, Chippenham, UK.

INTRODUCTION & MATERIAL AND METHODS

Killer whale presence in the Strait of Gibraltar is related to the migration of bluefin tuna (*Thunnus thynnus*) through the area. Two groups of orcas feed on tuna during 2 different seasons and using 2 different hunting strategies. Nevertheless, these orcas have also been observed feeding on other preys both during the tuna season, but mostly during the time when no bluefin tuna is present.

Sightings were carried out from 2 platforms of opportunity, represented by a 23 m long whale watching vessel with a capacity of 150 persons, and from a smaller vessel (6 m) with a capacity of 10 persons, from May to October 2003 through 2006. Fishermen from the small city of Tarifa and from the Almadrabas (set net fisheries used to catch tuna) were interviewed, as well as sport-fishermen. A stranded killer whale in Mai 2006 offered the unique opportunity to examine the stomach content of an adult female.



Figure 1



Figure 2



Figure 3



Figure 4

Figure 1: Bluefin tuna or what is left of it after a killer whale has interacted with it.

Figure 2: Sun fish (*Mola mola*) are abundant and are frequently targeted by orcas in the Strait of Gibraltar.

Figure 3: Amberjack being chased by killer whales in the Strait of Gibraltar.

Figure 4: Stranding of an adult female killer whale in the bay of Algeciras in May 2006.

RESULTS AND DISCUSSION

Field observations since 2004 have allowed to witness orca predation on other fish species than tuna, including sunfish (*Mola mola*), "voráz" or blackspot seabream (*Pagellus bogaraveo*), "palometa negra" or Atlantic pomfret (*Brama brama*) and "pez limón" or amberjack (*Seriola dumerilii*). In the case of sunfish, on several occasions adult killer whales were observed catching the fish, and then leaving it to the calves to train their skills. Regarding both other fish species, there seem to be interactions between orcas and the fisheries. Common cuttlefish ("Choco", *Sepia officinalis*) has also been reported as being preyed upon by killer whales, possibly explaining a potential competitive exclusion between pilot whales and killer whales. A female adult killer whale stranded in May 2006 presented a few cephalopod beaks in her stomach.

So far no predation of killer whales on other cetaceans has been observed in the Strait of Gibraltar, although there are historical accounts of orcas attacking fin whales (*Balaenoptera physalus*) in the area. Killer whale diet has also been determined by fatty acid analysis in different areas of the world, but as these groups in the Strait of Gibraltar are small, probably isolated and already under constant anthropogenic pressure, we would not recommend taking biopsies from this endangered population.

CONCLUSIONS

Orcas in the Strait of Gibraltar may feed primarily on bluefin tuna during its migration period, but not exclusively. During the rest of their presence in the Strait, which may be longer than thought before, they feed on other fish species, some of which are also targeted by human fisheries. No predation on other cetaceans has been reported in recent decades. Orca diet has also been determined by fatty acid analysis in different areas of the world, but as these groups in the Strait of Gibraltar are small, probably isolated and already under constant anthropogenic pressure, we would not recommend taking biopsies from this endangered population.

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REFERENCES

- Baird, R.W., and Dill, L.M. 1995. Occurrence and behaviour of transient killer whales: seasonal and pod-specific variability, foraging behaviour and prey handling. *Canadian Journal of Zoology* 73:1300-1311.
- Baird, R.W. (2000) The killer whale: Foraging specializations and group hunting. In: Mann, J., Connor, C.C., Tyack, P.L. and Whitehead, H. (Eds); *Cetacean Societies*, University of Chicago Press, Chicago, USA, 127-153.
- Baird, R.W., J.F. Borsani, M.B. Hanson, and P.L. Tyack. 2002. Diving and night-time behaviour of long-finned pilot whales in the Ligurian Sea. *Marine Ecology Progress Series* 237:301-305.
- Jefferson, T.A., Stacey, P.J., and Baird, R.W. 1991. A review of killer whale interactions with other marine mammals: predation to co-existence. *Mammal Review* 21:151-180.
- Notarbartolo di Sciara, G. 1987. Killer whale, *Orcinus orca*, in the Mediterranean Sea. *Marine Mammal Science* 3(4):356-360.



NMNH,
LUXEMBOURG (1)



TURMARES TARIFA,
SPAIN (2)



UNIVERSITY OF CADIZ,
SPAIN (3)



INACHUS, SPAIN (4)



WDCCS, UK (5)