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HIGH LEVELS OF INTERSPECIFIC INTERACTIONS IN THE STRAIT OF GIBRALTAR

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INTRODUCTION

Several types of interspecific interactions involving cetaceans are described in the literature, which are usually classified in aggressive or cordial interactions. Up to 7 species of cetaceans are present in the Strait of Gibraltar, of which 4 are present throughout the year and 3 only seasonally.

METHODOLOGY

Our research took place in the Strait of Gibraltar from platforms of opportunity, (the whale-watching boats "Jackelin" and "Dolphin Safari"), from May to October 2003 through 2007 (cf. Table 1). We selectively collected data, e.g. Beaufort sea state, wind strength and direction, group composition and behaviour, etc.

YEARS	EFFORT					
	NUMBER OF SIGHTINGS	NUMBER OF INTERACTIONS	ENCOUNTER RATE FOR TRIP (SIGHTING/TRIP)	SURVEY (Km)	SAMPLE TIME (hours)	BOAT TRIPS
2003	614	89	3.32	7270	429	185
2004	545	77	3.30	6063	363	165
2005	528	61	2.44	6989	461	216
2006	289	42	2.49	5283	287	116
2007	537	78	3.37	5545	334	159
TOTAL	2513	347		31150	1874	859

Table 1. Effort respect to the years and along the study's period.



Figure 1. The Jackelin, the platform of opportunity from which our sightings took place in 2003, 2004 and 2005.



Figure 2. The Dolphin Safari, the platform of opportunity from which our sightings took place in 2006 and 2007.

RESULTS AND DISCUSSION

A total of 2513 sightings were recorded, of which 347 included some type of interspecific interaction (cf. Table 2). The most frequently observed interactions involved long-finned pilot whales (*Globicephala melas*) and bottlenose dolphins (*Tursiops truncatus*) (56.48%), as well as short-beaked common dolphins (*Delphinus delphis*) and striped dolphins (*Stenella coeruleoalba*) (34%). In rarer occasions, we observed interactions with up to 3 species, e.g. 2 sightings including common dolphins, striped dolphins and long-finned pilot whales. Two additional sightings involved long-finned pilot whales, bottlenose dolphins and sperm whales (*Physeter macrocephalus*), and one sighting involved killer whales (*Orcinus orca*), a fin whale (*Balaenoptera physalus*) and long-finned pilot whales (cf. Figure 7). Most observed interactions consisted of non-aggressive behaviours, like travelling, resting or milling. However, some aggressive interactions between pilot whales and bottlenose dolphins, as well as pilot whales and killer whales were observed. We also observed clear interspecific mating attempts between pilot whales and bottlenose dolphins.

CONCLUSIONS

This high level of interspecific interactions may be explained by the relatively high density of cetacean species in the area, the reduced space, and the high amount of available food. The possible use of capacities of certain species, overlap of ecologic niches, territoriality and socialization between cetacean species might be some of the causes of the different types of associations in the area. Many interactions may represent fortuitous associations, but in some cases intentional associations seem more probable explanations (e.g. bottlenose dolphins/pilot whales, because of the pilot whale's better echolocation system compared to the bottlenose dolphin's), and even intentional dissociations, e.g. the pilot whale/killer whale chase. In the latter cases, no clear signs of competition have been observed but it may represent a major factor.

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SPECIES	INTERACTIONS	PERCENTAGE
PILOT WHALE-STRIPED DOLPHIN	6	1.73
PILOT WHALE-COMMON DOLPHIN	5	1.44
PILOT WHALE-STRIPED DOLPHIN-COMMON DOLPHIN	2	0.58
PILOT WHALE- BOTTLENOSE DOLPHIN	196	56.48
BOTTLENOSE DOLPHIN-FIN WHALE	2	0.58
STRIPED DOLPHIN- SPERM WHALE	2	0.58
STRIPED DOLPHIN-COMMON DOLPHIN	118	34.00
BOTTLENOSE DOLPHIN-SPERM WHALE	7	2.01
PILOT WHALE-SPERM WHALE	3	0.86
KILLER WHALE-PILOT WHALE	1	0.29
BOTTLENOSE DOLPHIN-COMMON DOLPHIN	1	0.29
STRIPED DOLPHIN-FIN WHALE	1	0.29
KILLER WHALE-FIN WHALE-PILOT WHALE	1	0.29
PILOT WHALE-SPERM WHALE-BOTTLENOSE DOLPHIN	2	0.58
TOTAL	347	

Table 2. Number of interspecific interactions along the study's period and the percentage.



Figure 3. Interaction between bottlenose dolphin and sperm whale. (Pierre Gallego)



Figure 4. Interaction between pilot whale and sperm whale. (Pierre Gallego)



Figure 5. Interaction between pilot whale and sperm whale.



Figure 6. Interaction between pilot whale and common dolphin.



Figure 7. Interaction between killer whale and striped dolphin.



Figure 8. Pilot whales chasing killer whales (not appear in the picture) who was interacting with a fin whale.