SC/66b/FORINFO/15

Who is following whom? Interspecific associations between bottlenose dolphins and pilot whales in deep waters off La Gomera. M.E.E.R. e.V. , 4pp

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INTERNATIONAL
WHALING COMMISSION

Who is following whom?
Interspecific associations between bottlenose dolphins and pilot whales in deep waters off La Gomera

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Introduction

Off La Gomera (Canary Islands, Spain) a total of 23 cetacean species have been documented with bottlenose dolphins (*Tursiops truncatus*) and short-finned pilot whales (*Globicephala macrorhynchus*) being sighted most commonly, and often together in mixed groups. In this study we investigate the location, environmental parameters and group characteristics of interspecific associations and compared them to single-species-sightings. We aim to answer the following questions: Do the two species randomly aggregate? Which species, if any, initiated the aggregations? We discuss possible benefits or disadvantages to identify the driving factors for group associations.

Methods

We collected sighting data opportunistically and year round from whale watching vessels during regular trips in long-term co-operation with a local whale watching operator. We documented group size, group composition, depth, slope, and distance to coast for both species.

Results

From 1995 through 2014 a total of 2,769 bottlenose dolphins and 2,515 pilot whale sightings were recorded during which aggregations of the two species observed on 569 occasions. Results showed that interspecific associations were not of random nature, as group size and group structure differed significantly within the associations as compared to single-species-sightings. First, mixed groups were found exclusively in the preferred habitat of pilot whales in deep waters with the physical parameters (distance to coast, depth and slope, unifactorial variance analysis, Post-hoc-Bonferroni-Test, $p<0.05$) of mixed group sighting being very similar to single species pilot whale sightings (see Figure 1 a-c).

Second, average numbers of animals within mixed groups differed significantly from single-species groups (Post-hoc-Bonferroni-Test, $p<0.05$), i.e. the number of bottlenose dolphins was smaller while the number of pilot whale was larger within mixed groups compared to single species groups (see Figure 2). This phenomenon persisted through all seasons.

Third, the group composition of bottlenose dolphins was remarkably different, with less juveniles and calves seen when they aggregated with pilot whales (see Figure 3). At the same time, the presence of calves and juveniles within pilot whales did not differ between single-species and mixed-species groups.

Discussion

Our results indicate that bottlenose dolphins and pilot whales did not form associations randomly, rather bottlenose dolphins were actively seeking the vicinity of pilot whales - although it has to be stressed that more research is needed to confirm this assumption.

But what are the reasons? Hypotheses for the motivation include predator avoidance, feeding success and social advantages. On the one hand, bottlenose dolphins could take advantage from feeding pilot whales to identify prey presence (Connor, 2000; Norris & Dohl, 1980; Quérouil et al., 2008). As opportunistic feeders, the dolphins may occasionally also feed on squid, the exclusive prey of pilot whales. Better protection from predators such as high sea sharks can also play a role. In this case, the presence (and potentially the vigilance) of the larger pilot whales could make predator detection and avoidance easier for the dolphins (Stensland, 2003; Quérouil et al., 2008). Finally, the dolphins could initiate associations with pilot whales for social reasons (Herzing & Johnson, 1997, Smit et al., 2010). Curiosity and play may be the driving motivations here, and in fact, affiliative interactions have been observed between both species, and sometimes also between bottlenose dolphin adults and pilot whale calves (which have roughly the same size). Observed interactions mostly were of non-aggressive nature.

Further studies on specific (group and individual) behaviours performed during inter-species associations will shed more light on the reasons for the bottlenose dolphins seeking the vicinity of their larger relatives.

Acknowledgements

This study was conducted with the support of the University of Greifswald. M.E.E.R. e.V. is funded by the Society for the Protection of Dolphins (GRD, Munich). Many thanks to our co-operation partner OCEANO Gomera for willingly taking part in and supporting scientific research. A special thank you to all whale watching skippers and tour guides who contributed to data collection. Tina Sommer greatly helped to improve the final text with her excellent review. Finally, M.E.E.R.'s work would not be possible without the great and voluntary support of its active membership.

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Figure 1: **Water depth (a), distance to coast (b) and slope (c) during sightings of bottlenose dolphins (BD), pilot whales (PW) and mixed groups (BDPW) off La Gomera (1995-2014)**

Figure 1a

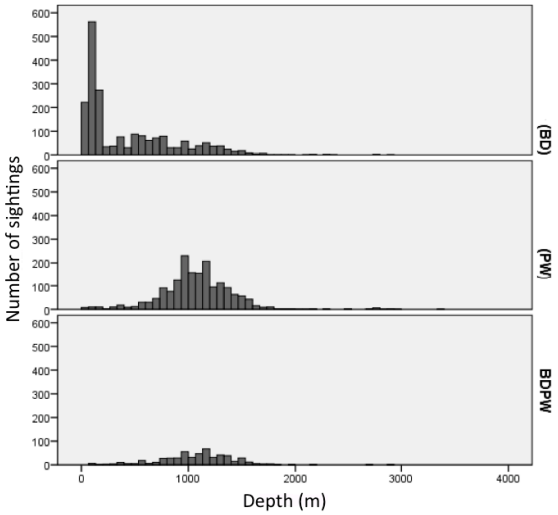

Figure 1b

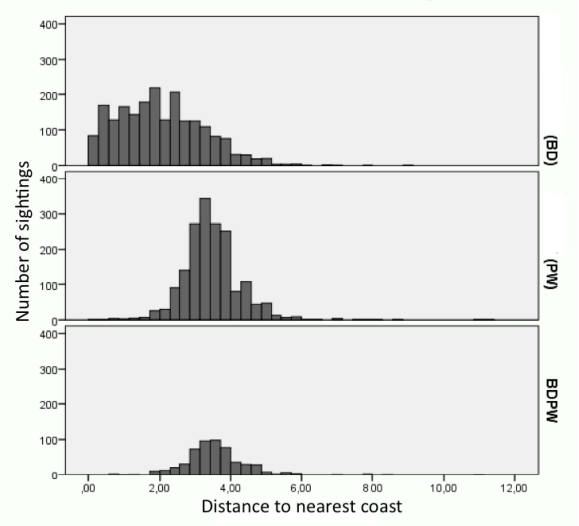

Figure 1c

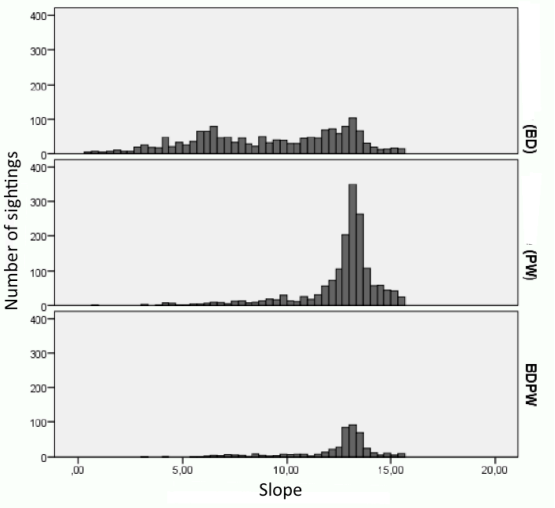

Figure 2: **Mean group sizes during sightings of five types of groups of bottlenose dolphins and pilot whales off La Gomera (1995-2014)**

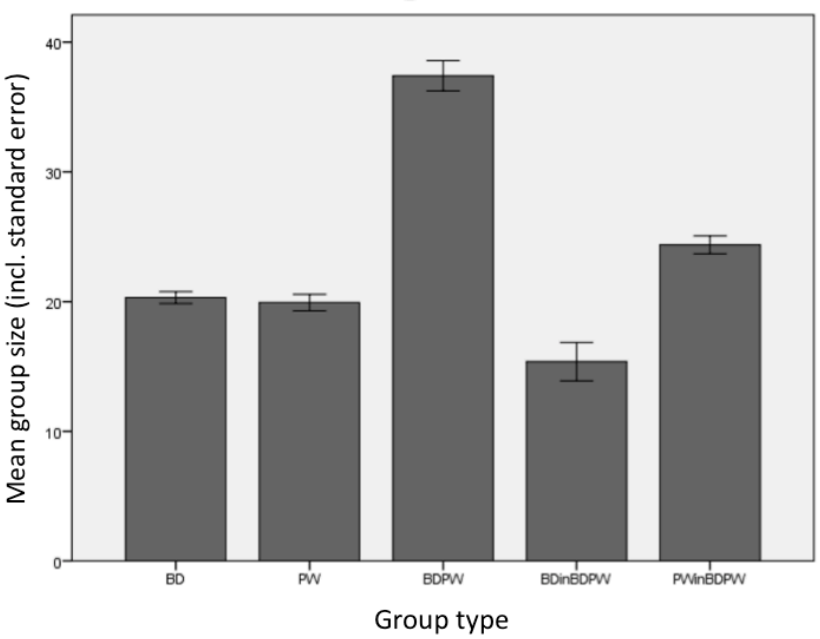

Figure 3: **Group composition of bottlenose dolphin groups sighted off La Gomera, with and without the presence of pilot whales (1995-2014)**