

Common dolphin and bottlenose dolphin communication influenced by touristic vessels in the Algarve, Portugal

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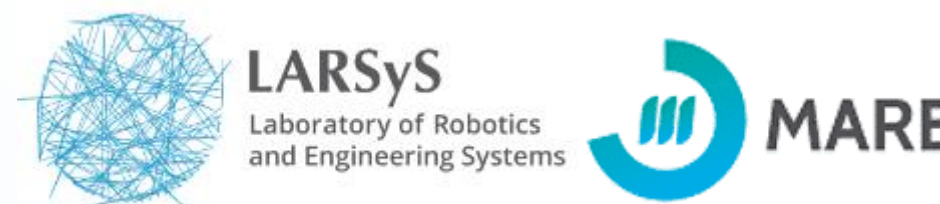


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Introduction

The south coast of Portugal is known for the occurrence of several species of cetaceans. Over the last few years there has been a significant increase in the number of dolphin-watching vessels in this region, which might lead to short- and long-term impacts in the wild dolphins. This study assesses the impact of underwater noise in the main target species of the dolphin watching industry: common dolphins (*Delphinus delphis*) and bottlenose dolphins (*Tursiops truncatus*).

Methodology

Underwater recordings were collected from June to September 2022 (**Fig. 1**) with an autonomous hydrophone (DigitalHyd SR-1). We analyzed different whistle parameters according to the numbers of dolphin-watching vessels. A total of 15h of acoustic recordings were analyzed (Audacity2.4.2). The Kruskal-Wallis test was used to assess the differences in the whistle parameters according to the number of vessels.

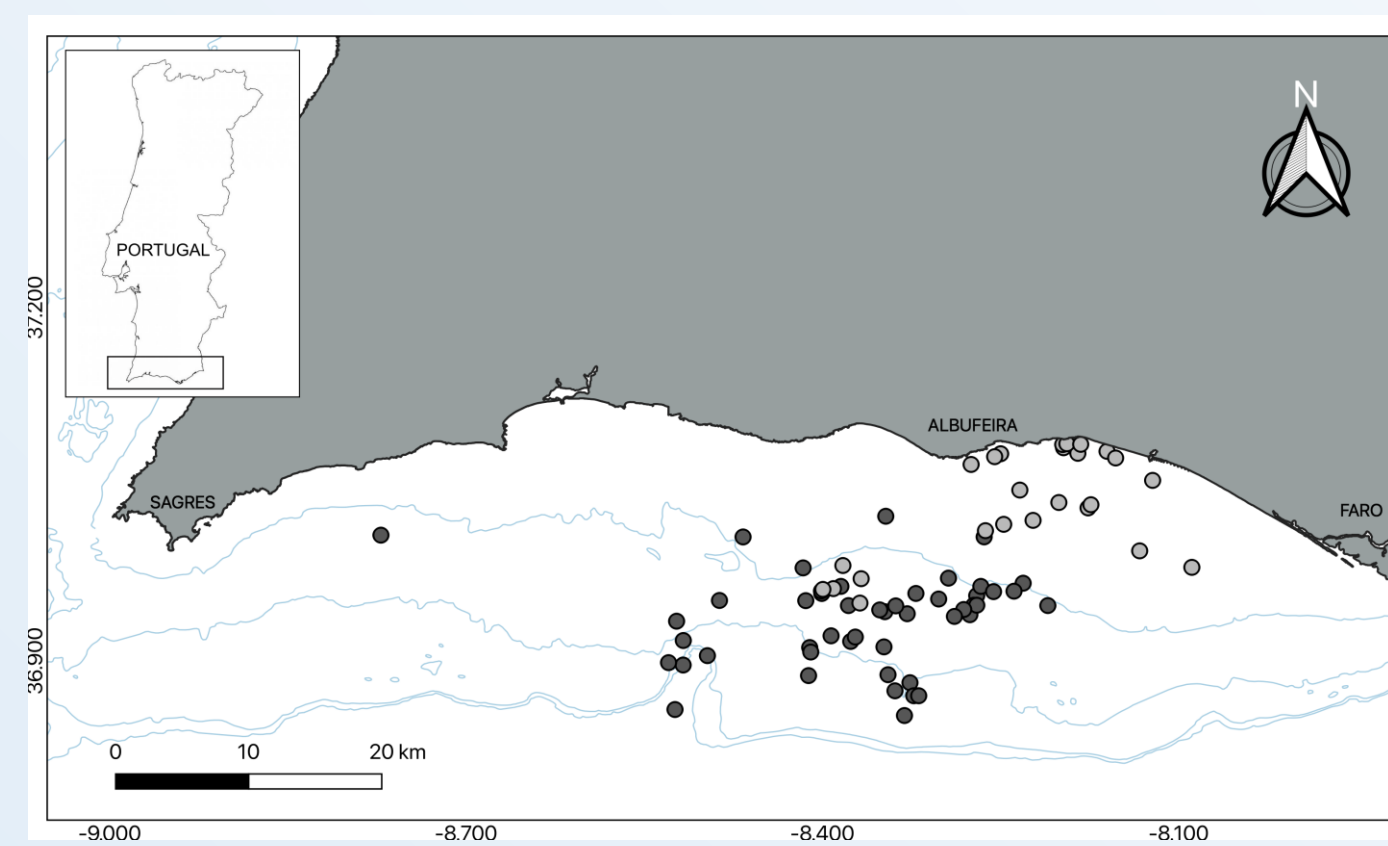


Fig. 1 – Study area, starting location of acoustic records (light grey: *Tursiops truncatus*; dark grey: *Delphinus delphis*).

Results

Whistle rate (whistles/min/group size) varied between species and with the number of vessels.

Bottlenose dolphins produced more whistles and overall, the **whistle production decreased with increasing number of dolphin-watching vessels for both species (Fig. 2).**

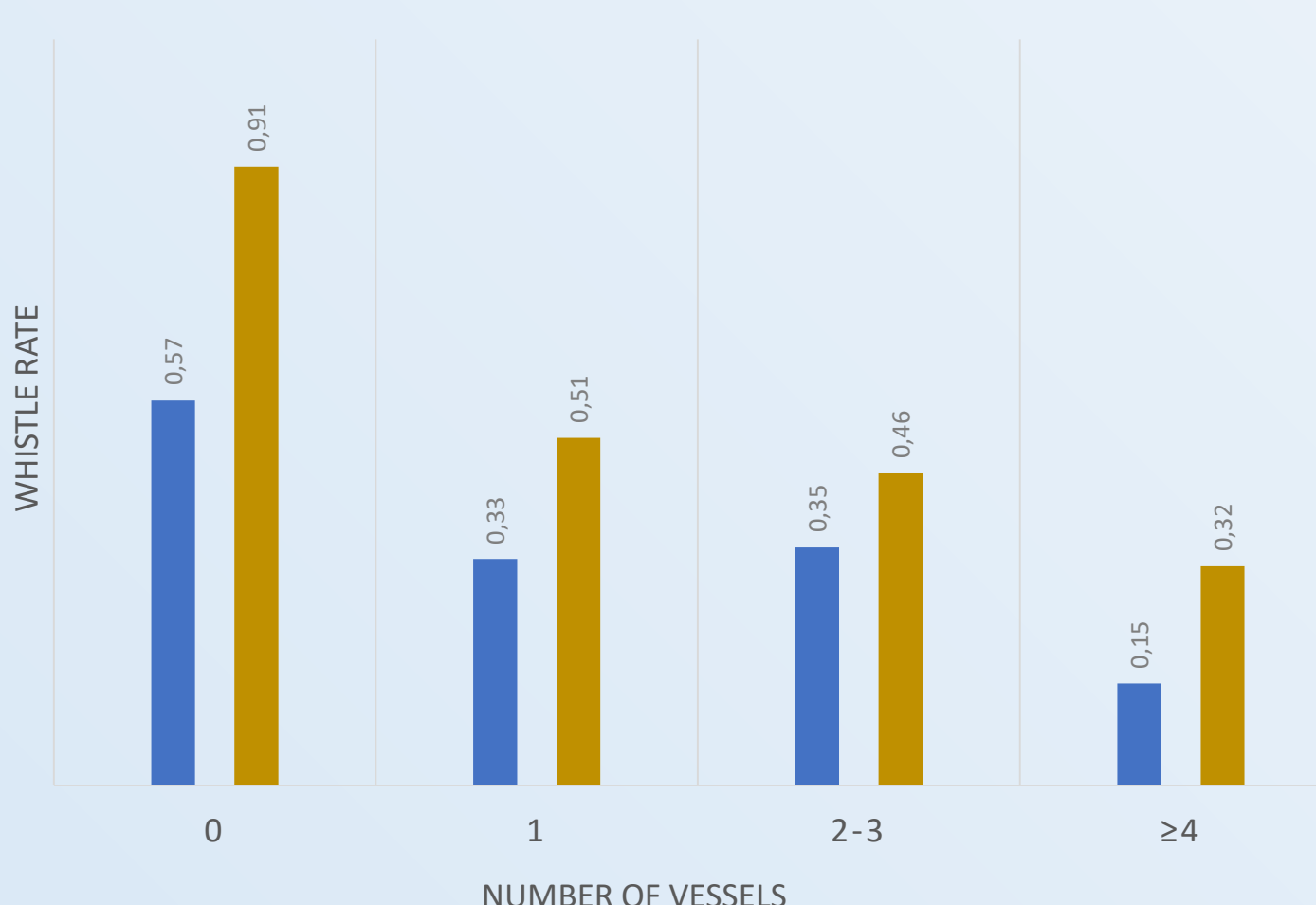
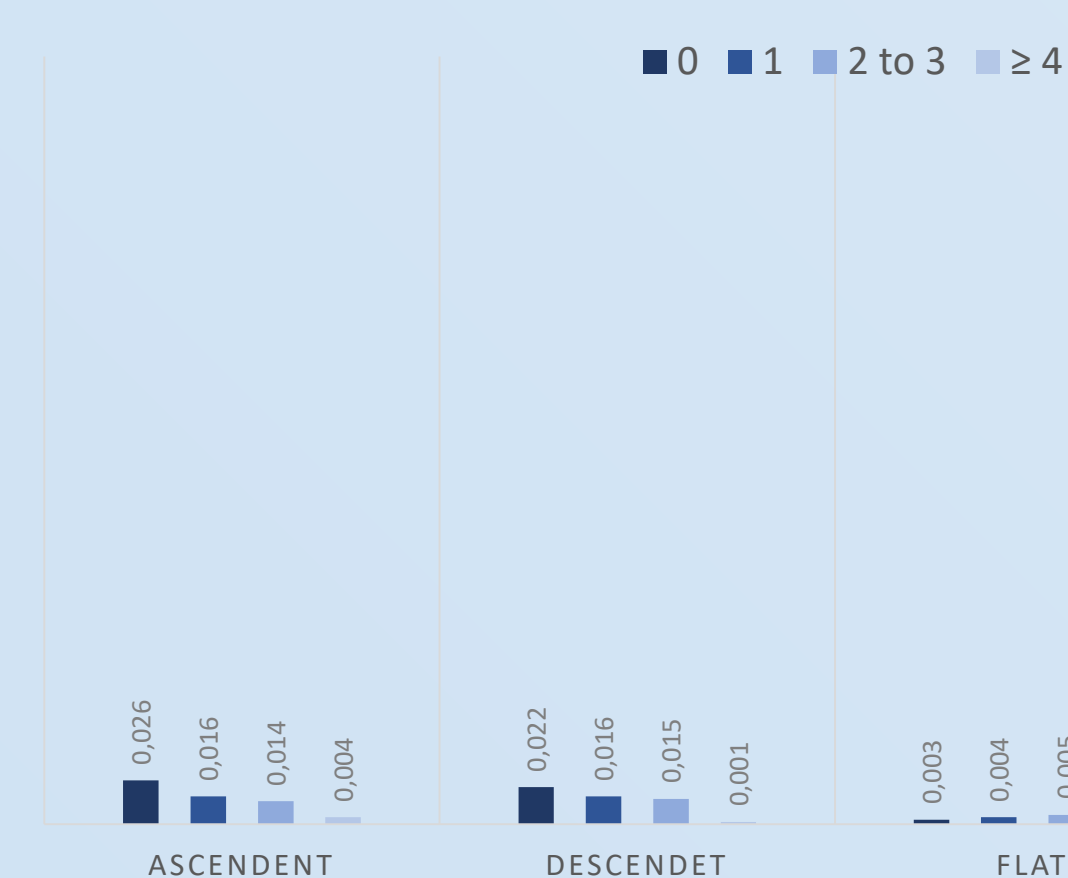


Fig. 2 – Whistle rate for the species *Delphinus delphis* (blue), and *Tursiops truncatus* (orange) with different numbers of vessels.

a) *Delphinus delphis*



b) *Tursiops truncatus*

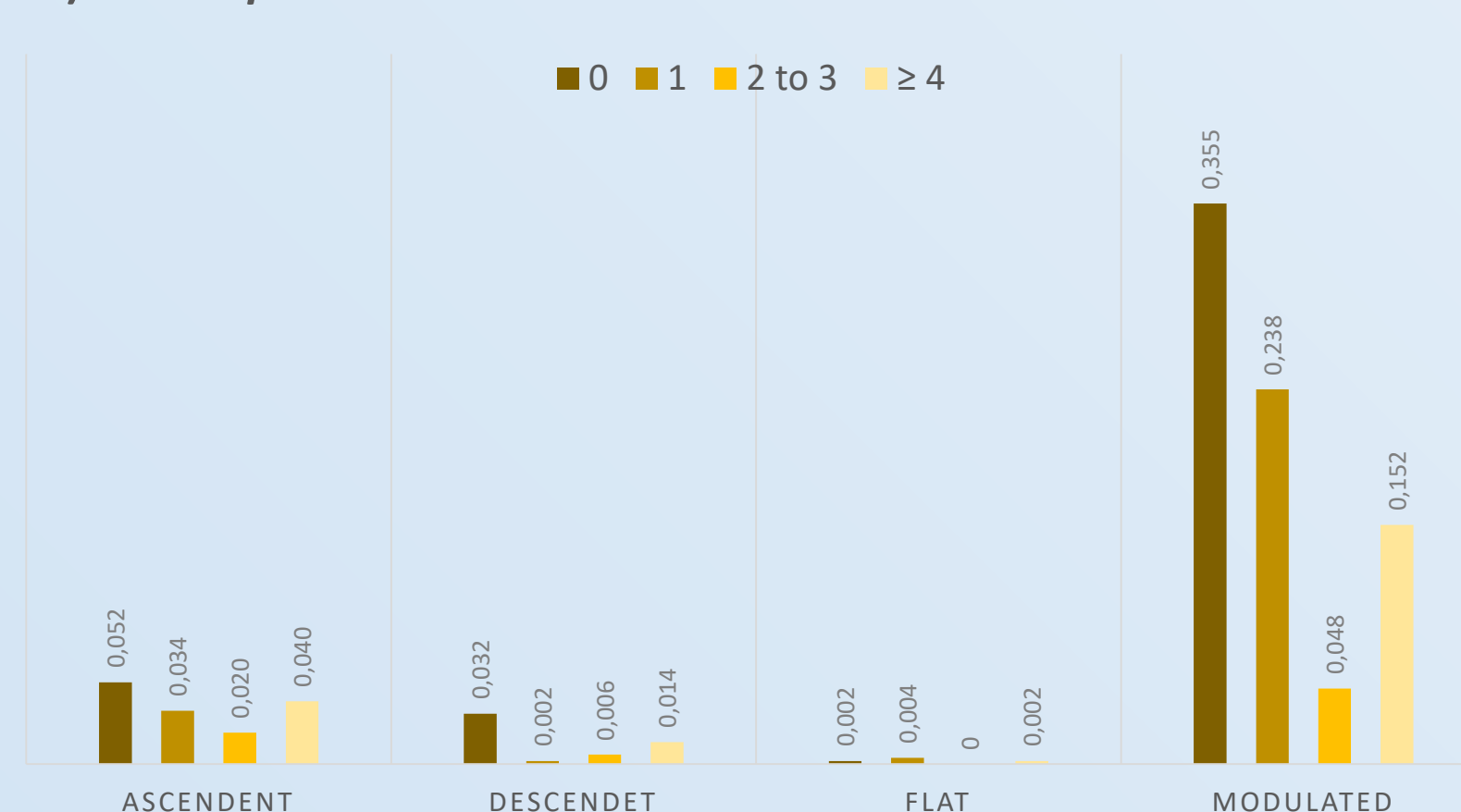


Fig. 3 – Percentage of different types of whistles (ascendent, descendent, flat, modulated) for a) *Delphinus delphis* and b) *Tursiops truncatus*, according to the number of dolphin watching vessels (0,1,2 to 3, ≥4).

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More info!



The number of ascending, descending and modulated whistles tended to **decrease** as the **number of tour vessels increased**, while the flat whistles did not show the same pattern with an increasing number of tour vessels (**Fig. 3**).

Our results showed a **significant increase** in the **start, low and high** frequency of whistles of both species when **exposed to the presence of dolphin-watching tour vessels compared to whistles emitted in the absence of boats (Fig. 4).**

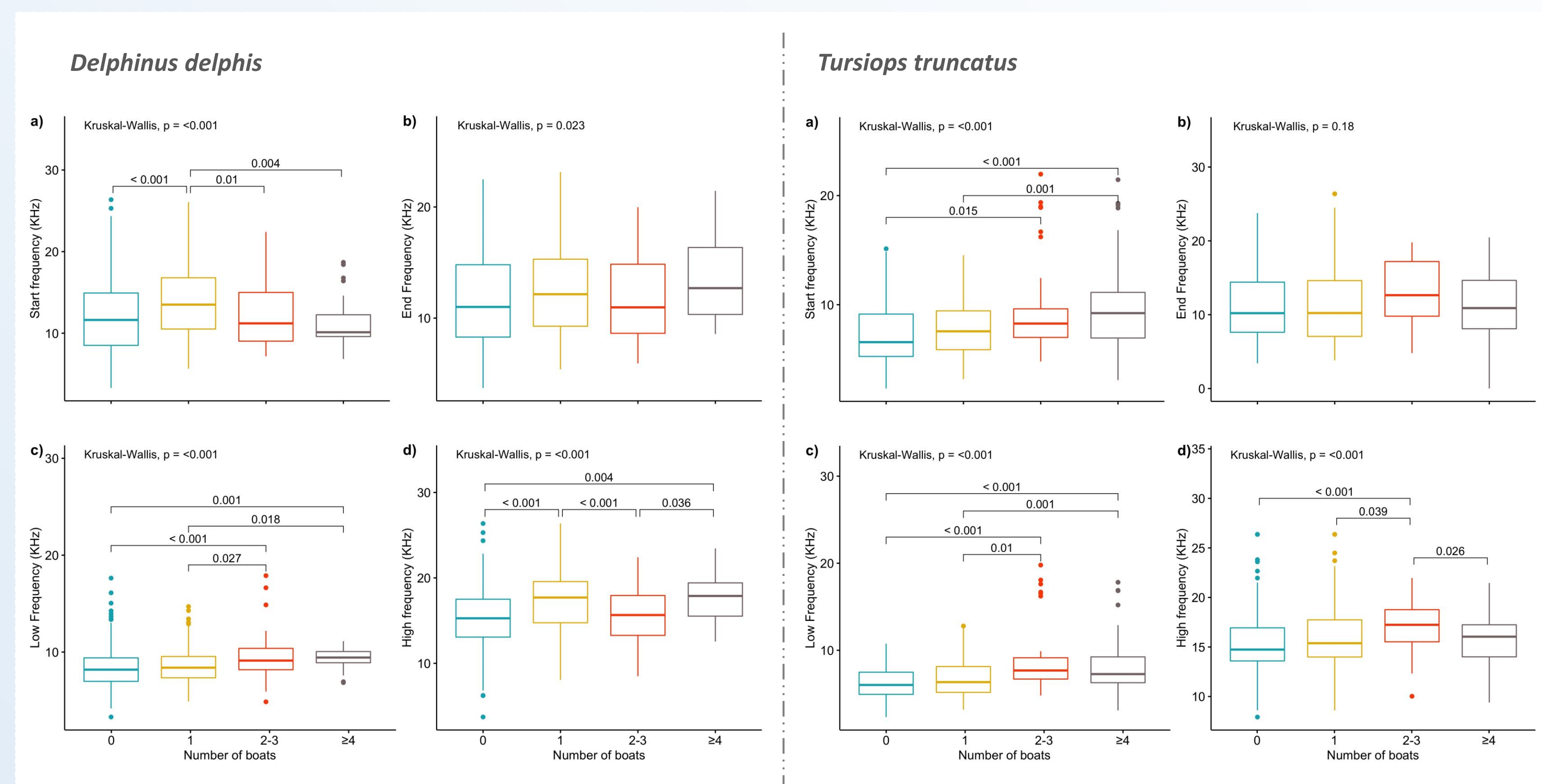


Fig. 4 – Distribution of a) start frequency, b) end frequency, c) low frequency, d) high frequency of whistles for *Delphinus delphis* (left) and *Tursiops truncatus* (right).

Conclusion

These findings indicate that the underwater noise resultant from dolphin-watching tours affects the vocalization of dolphins in the Algarve by potentially reducing the communication range of whistles. We strongly recommend more acoustic studies in this area to enhance the current understanding and to reduce potential impacts of the dolphin watching activities on wild populations of dolphins.