Whistle parameters in bottlenose dolphins (*Tursiops truncatus*) in the Gulf of Trieste, northern Adriatic Sea

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INTRODUCTION

The resident population of bottlenose dolphins in the Gulf of Trieste, northern Adriatic sea, has been studied for the past 20 years by Morigenos. In 2019 a study on the social structure of this population revealed strong partitioning between 2 distinct clusters (A and B), using the same area at different times of the day (morning vs. afternoon)[1]. Moreover, cluster A regularly interacts with trawlers whereas B does not[1]. The aim of this study was to investigate signature whistles (SW) produced within the two social groups, and a third group not included in the previous study, which may enable identification of individuals or social groups from recordings collected during passive acoustic monitoring.

METHODS

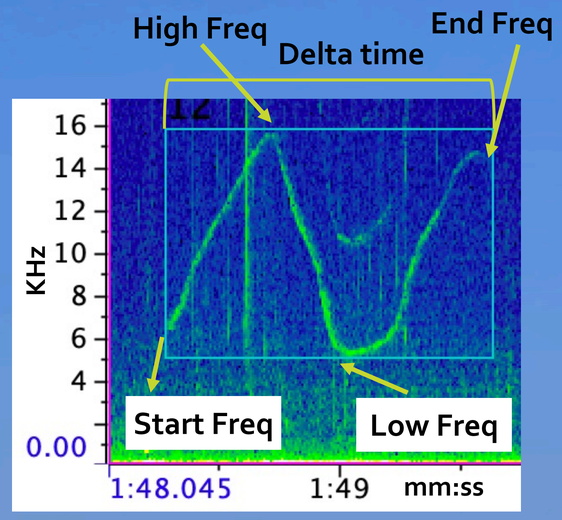
- Recordings were collected from Jan 2021 to Nov 2022
- Identification of individuals was conducted using Photo ID
- HTI-96-MIN hydrophone with the TASCAM DR-680MKII recorder
- SIGID method[2] for SW analysis with Raven Pro[3]
- Low and High Frequency (Hz) and duration (s) extracted automatically, Start and End frequency (Hz) extracted manually

Summary of SW parameters

	Group	Delta Time (s)	Low Freq (Hz)	High Freq (Hz)	Start Freq (Hz)	End Freq (Hz)
N	A	26	26	26	26	26
	B	206	206	206	206	206
	C	35	35	35	35	35
Mean	A	1.47	6153	13718	8391	8517
	B	1.13	5318	14814	6693	10709
	C	0.982	5128	15487	7024	10001
Standard deviation	A	0.608	1264	1781	1197	2746
	B	0.586	1346	2447	2624	4537
	C	0.665	1549	5597	4052	2675

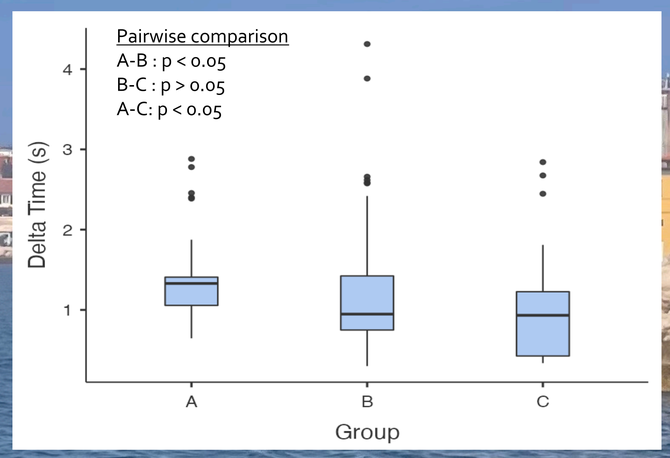
CONCLUSIONS

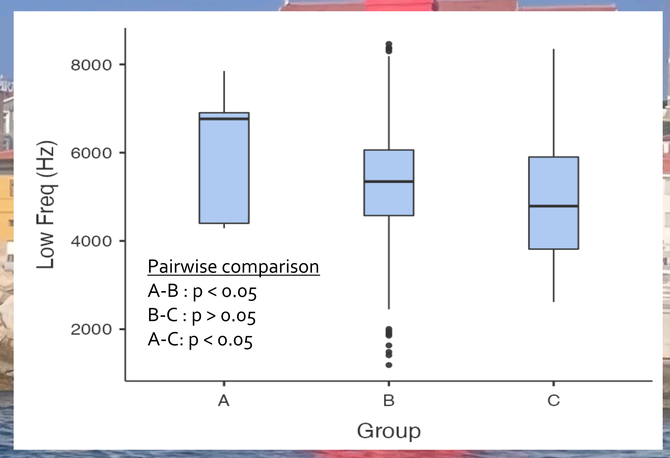
- The disparity in parameters may be due to distinct foraging strategies adopted by each group
- Could the foraging strategies and behavioural differences affect the acoustic development of individual SW?
- Further research may yield more conclusive results (sample size limitation)
- Future work → investigate other sounds (other whistles, BP sounds, clicks etc..)

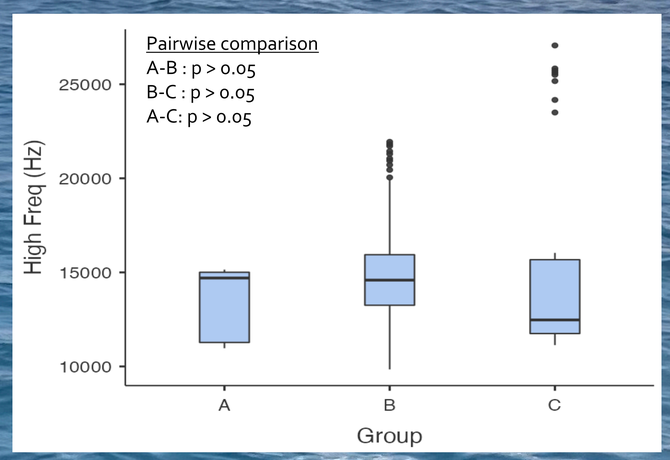


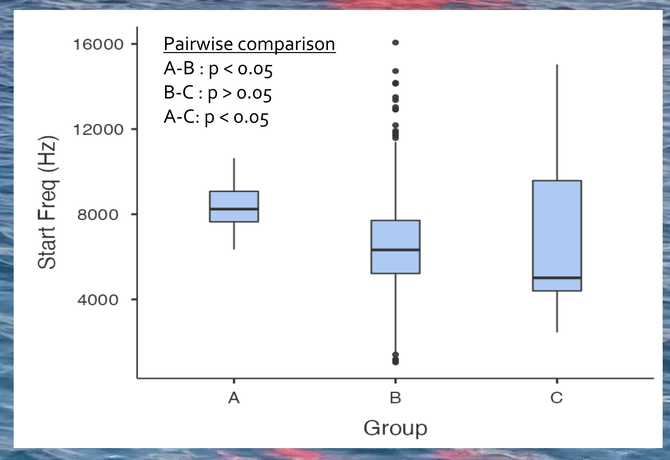
RESULTS

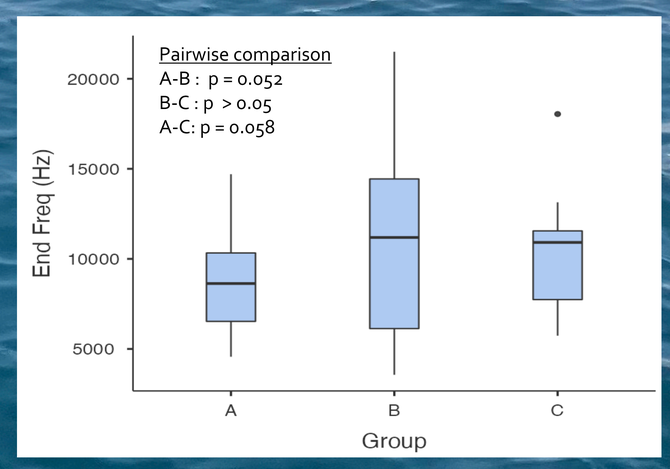
- Statistically significant differences ($p < 0.05$) in Low Freq, Start and End Freq between the 3 groups [4,5]
- Cluster A SW whistles have longer duration; higher start frequency, low frequency and lower end frequency than cluster B (pairwise comparison) [4, 5, 6]











Kruskal-Wallis

	χ^2	df	p
Delta Time (s)	14.23	2	<.001
Low Freq (Hz)	10.55	2	0.005
High Freq (Hz)	5.09	2	0.078
Start Freq (Hz)	24.15	2	<.001
End Freq (Hz)	6.49	2	0.039

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