

Bottlenose dolphin whistles indicate less stress during COVID-19 pandemic

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Overview

Bioacoustics and
Stress

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Bottlenose
Dolphin
Communication

Acoustics
Types of Calls

Boat Presence
and Stress

COVID-19 Boat Presence
Impacts

Importance

1 Bottlenose Dolphin Communication

- Acoustics
- Types of Calls

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Acoustic Communication

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- Dolphins produce sound using "monkey lips" in the nasal sac area.
- This creates a sound wave.
- This sound wave is perceived in other dolphins through conduction from the lower jaw bone to the middle ear.

Types of Dolphin Communication

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- echolocation clicks: used for finding prey
- variant whistles: function is poorly understood
- signature whistles: indicate individual identity similar to a name

Importance of Signature Whistles

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■ Identify individual identity

Importance of Signature Whistles

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- Identify individual identity
- Help reconnect with conspecifics

Importance of Signature Whistles

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- Identify individual identity
- Help reconnect with conspecifics
- Mother/calf pairs use to stay together

Bottlenose Dolphin Audiogram Compared to Other Cetaceans

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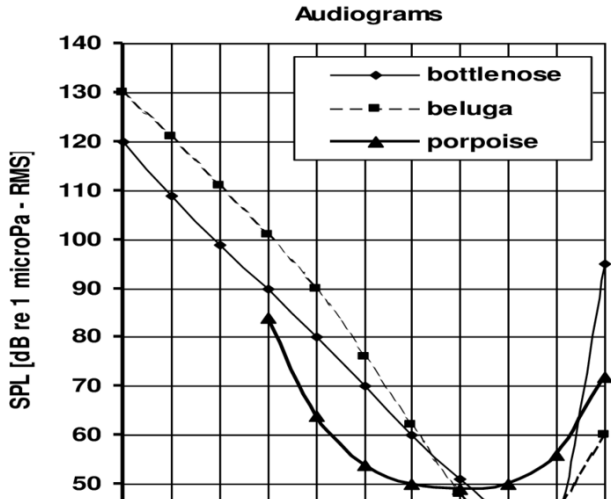
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Whistle Parameters

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Peak Frequency	Delta Time	Inflection Points
435.23	2.453	3
45.324	3.436	0
564.435	0.352	1

Table: Whistle Parameters from Bottlenose Dolphins

Noise Masking

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Noise masking occurs when other objects in the acoustic field overlap with the same frequency an organism is communicating at.

Organisms may avoid noise masking by changing the frequency of their calls, the number of time they call, or the duration of their calls to better be heard. This fits with the acoustic adaptation hypothesis.

Acoustic Adaptation Hypothesis

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Theory

Individuals are more successful when their signals can be received. This requires being able to avoid masking.

Example

Frogs lower their call frequency in the presence of busy and loud highways.

Importance

This determines individual fitness.

Embedded R Code; fragile frame

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```
# show some output...
```

```
runif(10)
```

```
## [1] 0.08727965 0.61932732 0.36822169 0.54319
```

```
## [7] 0.67598206 0.69736277 0.46447823 0.53577
```

Embedded R Figure; fragile frame

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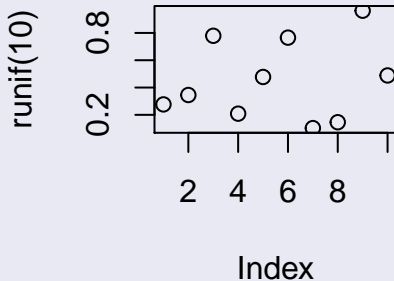
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The End