

What shellfish tell fish: Sound production and perception in the American lobster (*Homarus americanus*)

Renske Kerkhofs

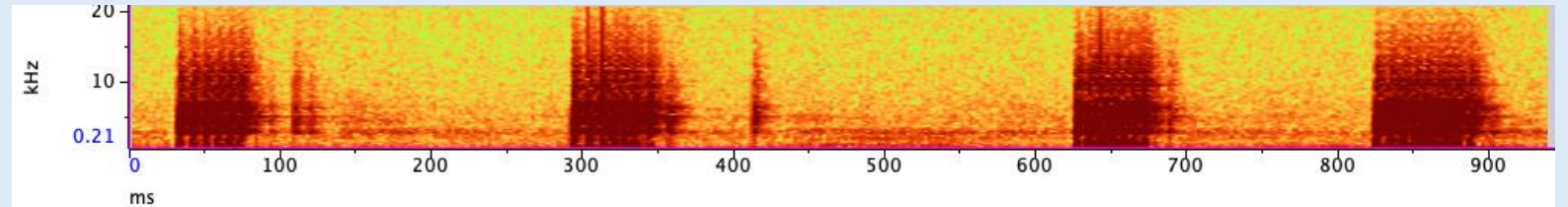
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Lobsters make sound!

Panuliris argus



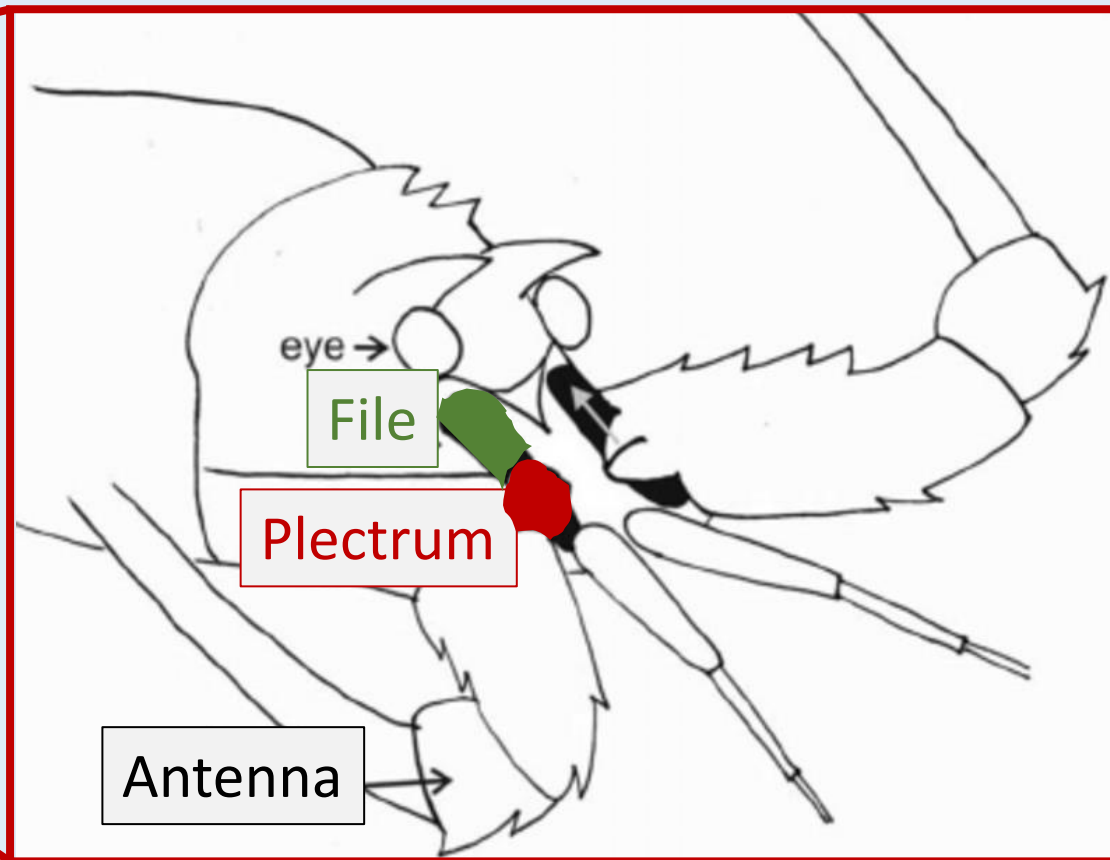
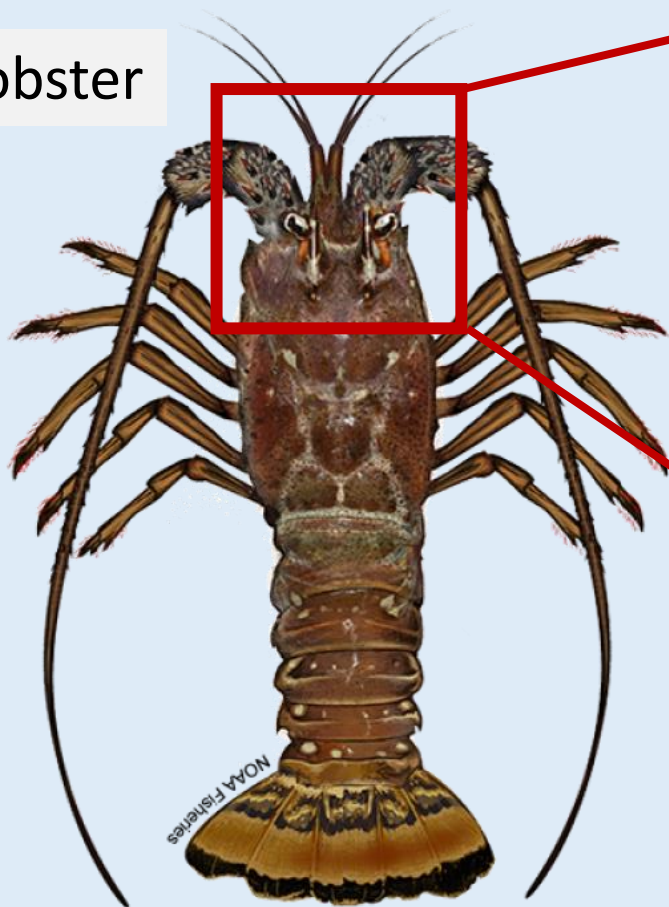
“Rasp”

Baeza et al., 2022

Patek, 2001

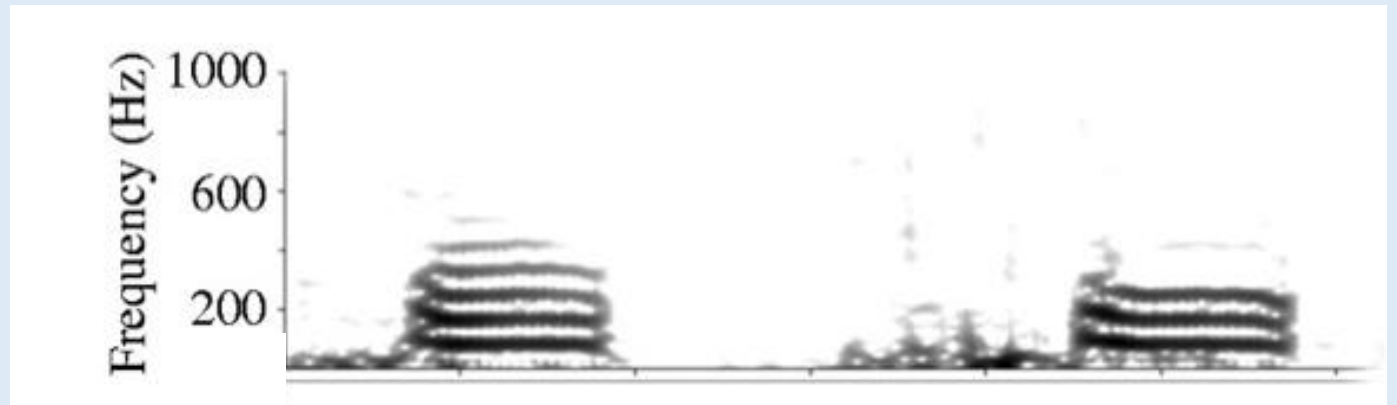
Lobsters make sound!

Spiny lobster



Patek et al., 2009

Lobsters make sound!

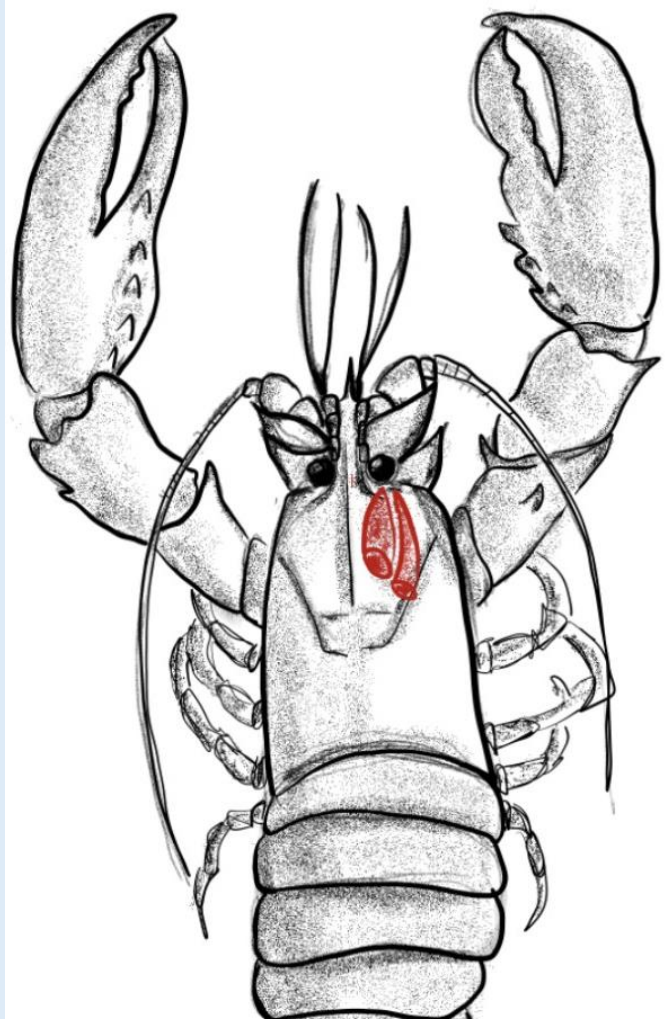


Henninger and Watson, 2005

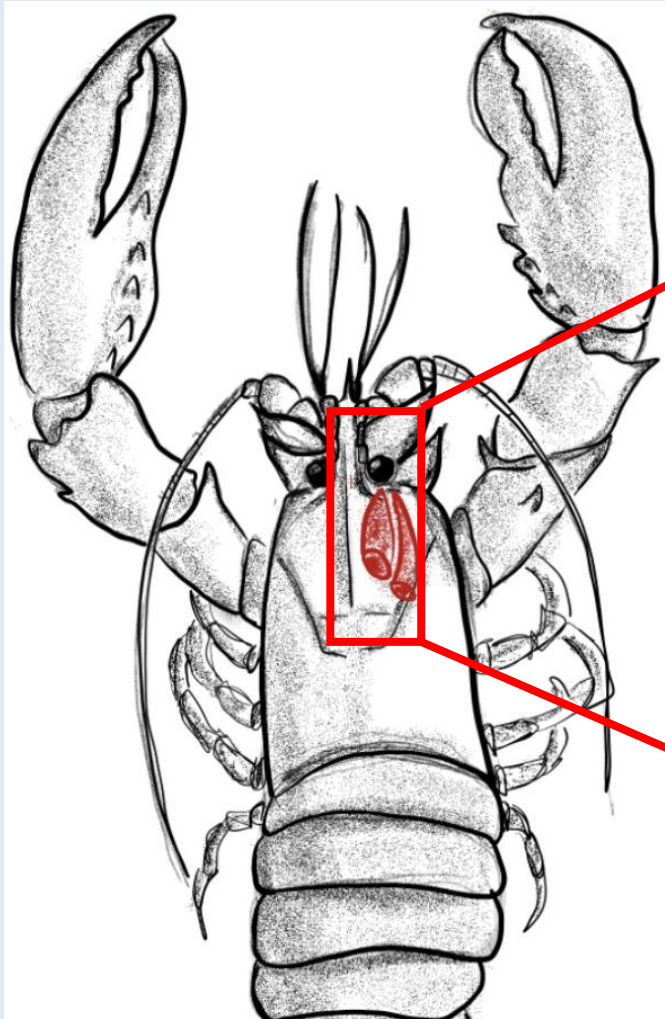


“Buzz”

Lobsters make sound!



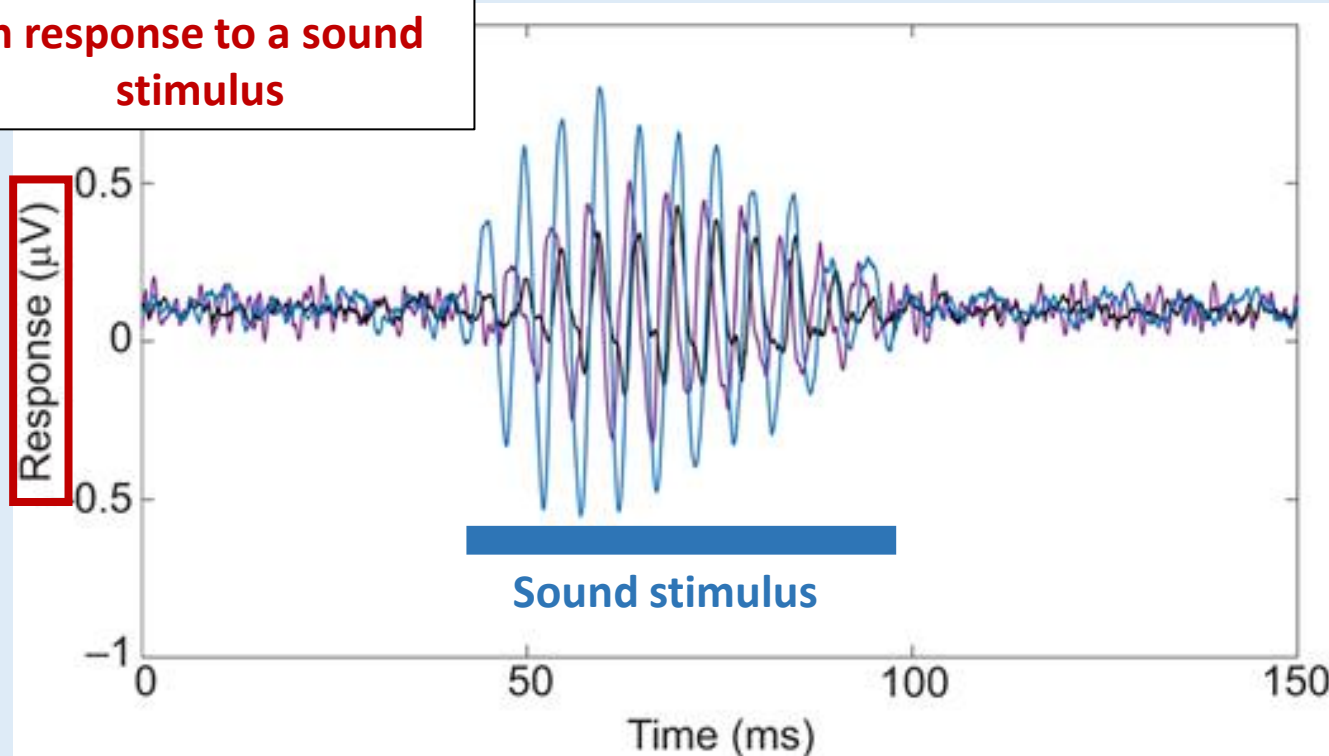
Lobsters make sound!



Henninger and Watson, 2005

Lobsters can hear!

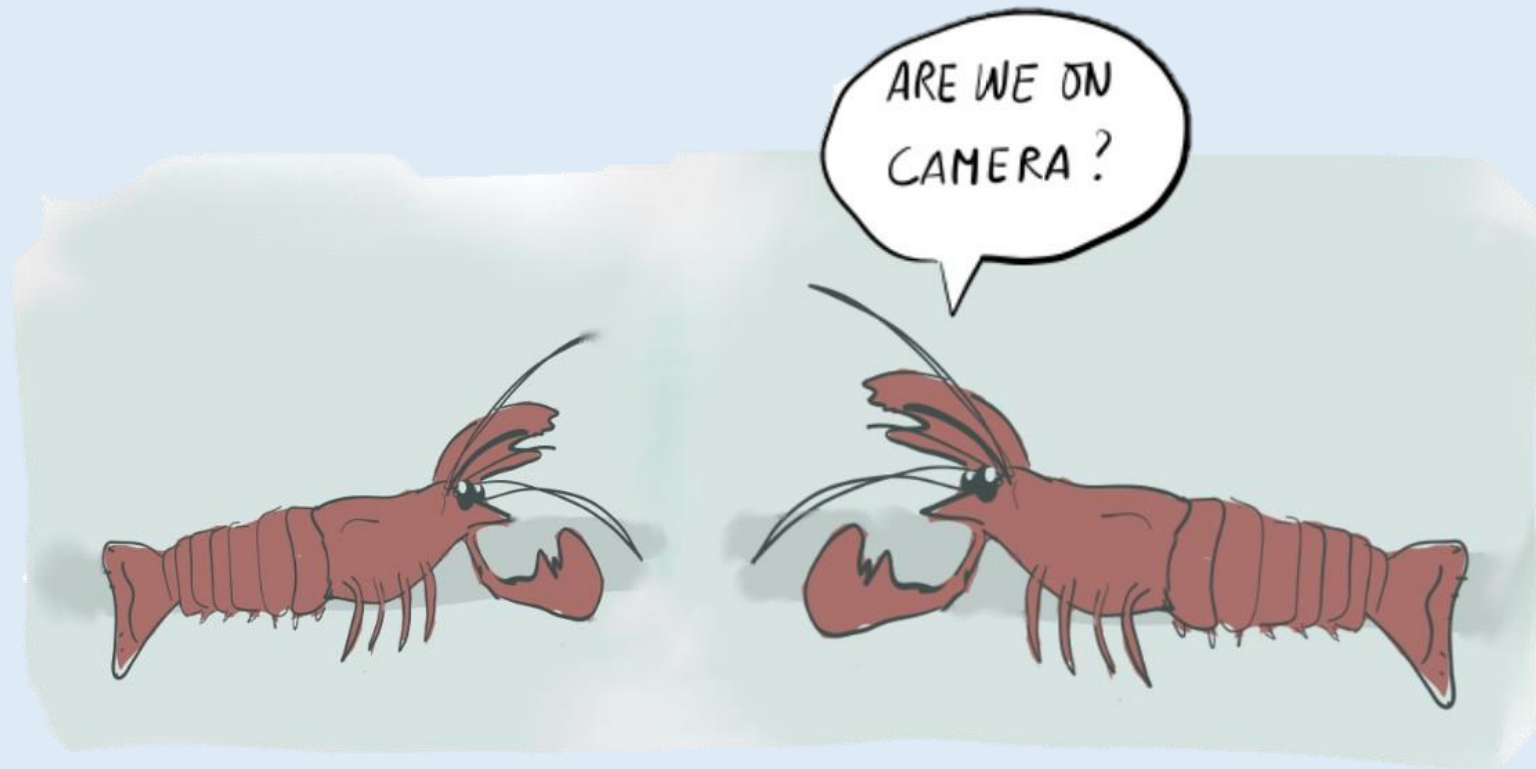
Electric activity in brain
in response to a sound
stimulus



“However, AEPs could be eliminated (or highly reduced) after immobilizing **hairfans**, which cover much of lobster bodies.”

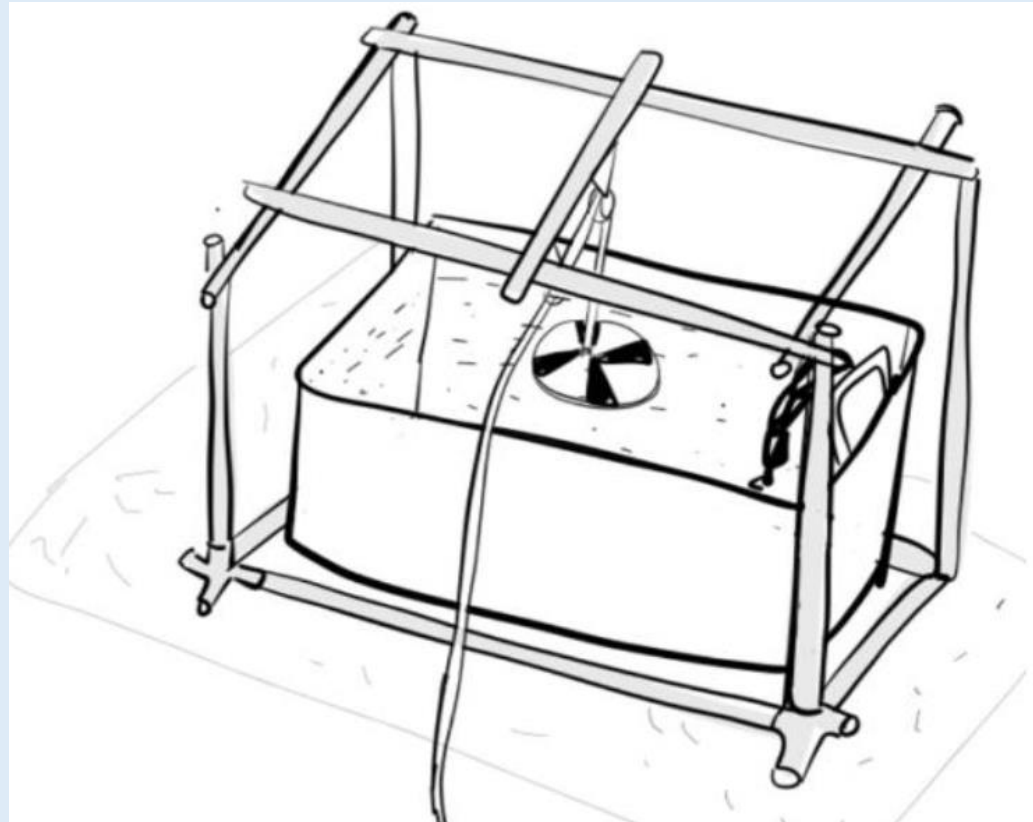
Jézéquel et al., 2021

Why do lobsters make noise?

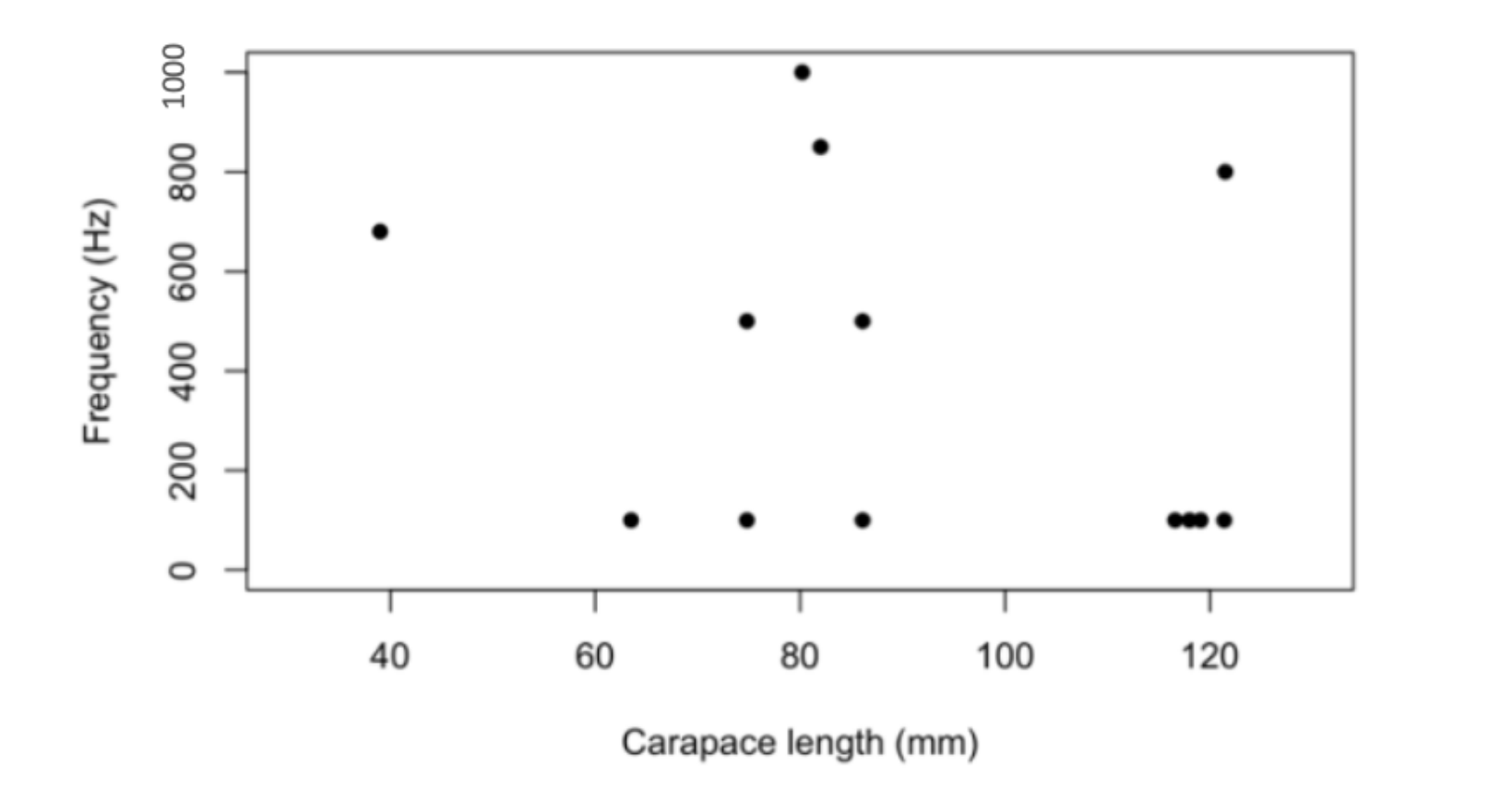


1. Size experiment

Goal: see if the frequency of sound made is related to carapace length

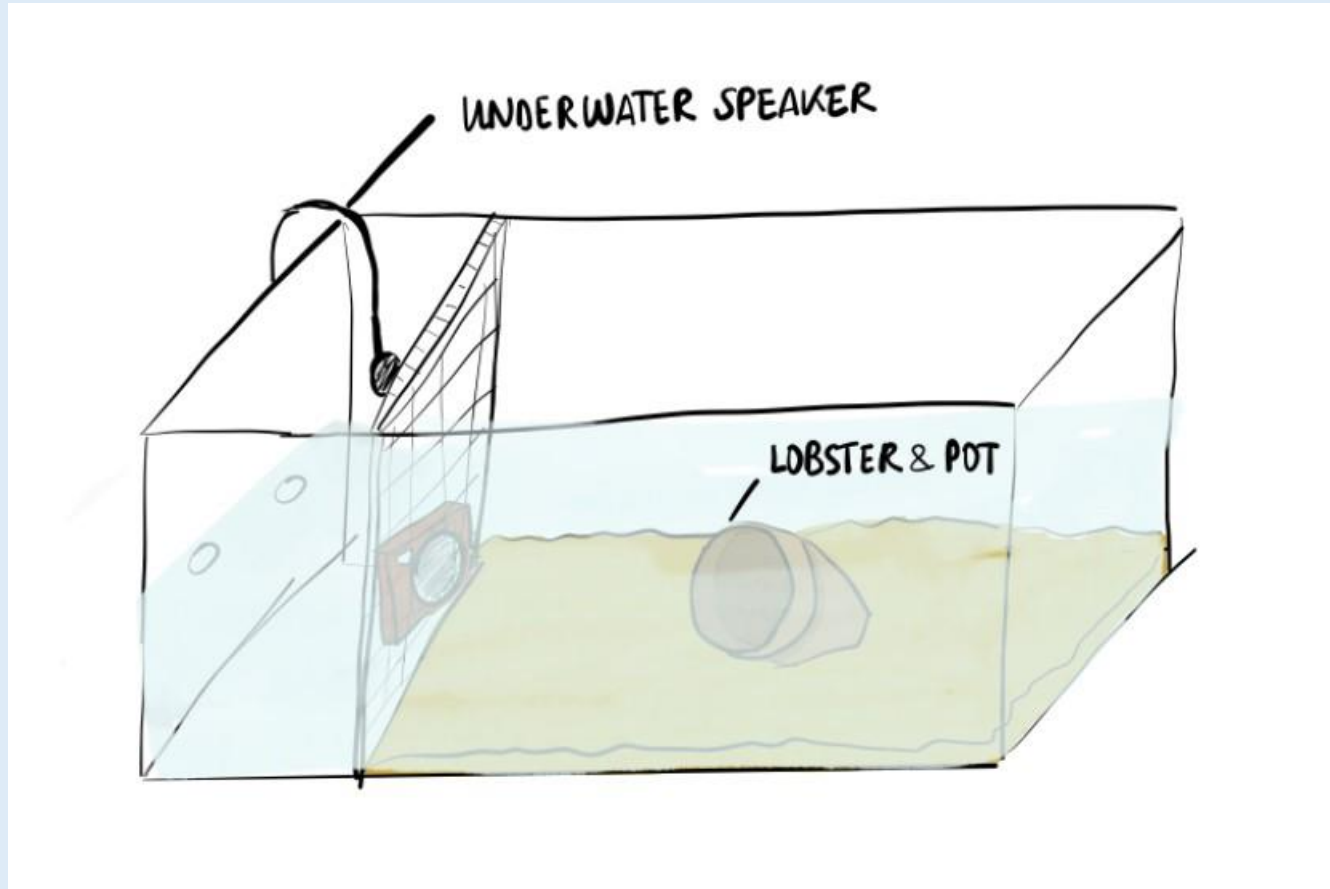


Carapace size did not affect the average frequency of hums.



2. Playback experiment

Goal: look at behavioral reactions to different sounds



1. Lobster buzz
2. White noise
3. Silence

2. Playback experiment

- 2 Fleeing
- 1 Avoidance
- 0 No reaction
- 1 Initiation
- 2 Initiation
- 3 Threat display
- 4 Threat display
- 5 Physical contact

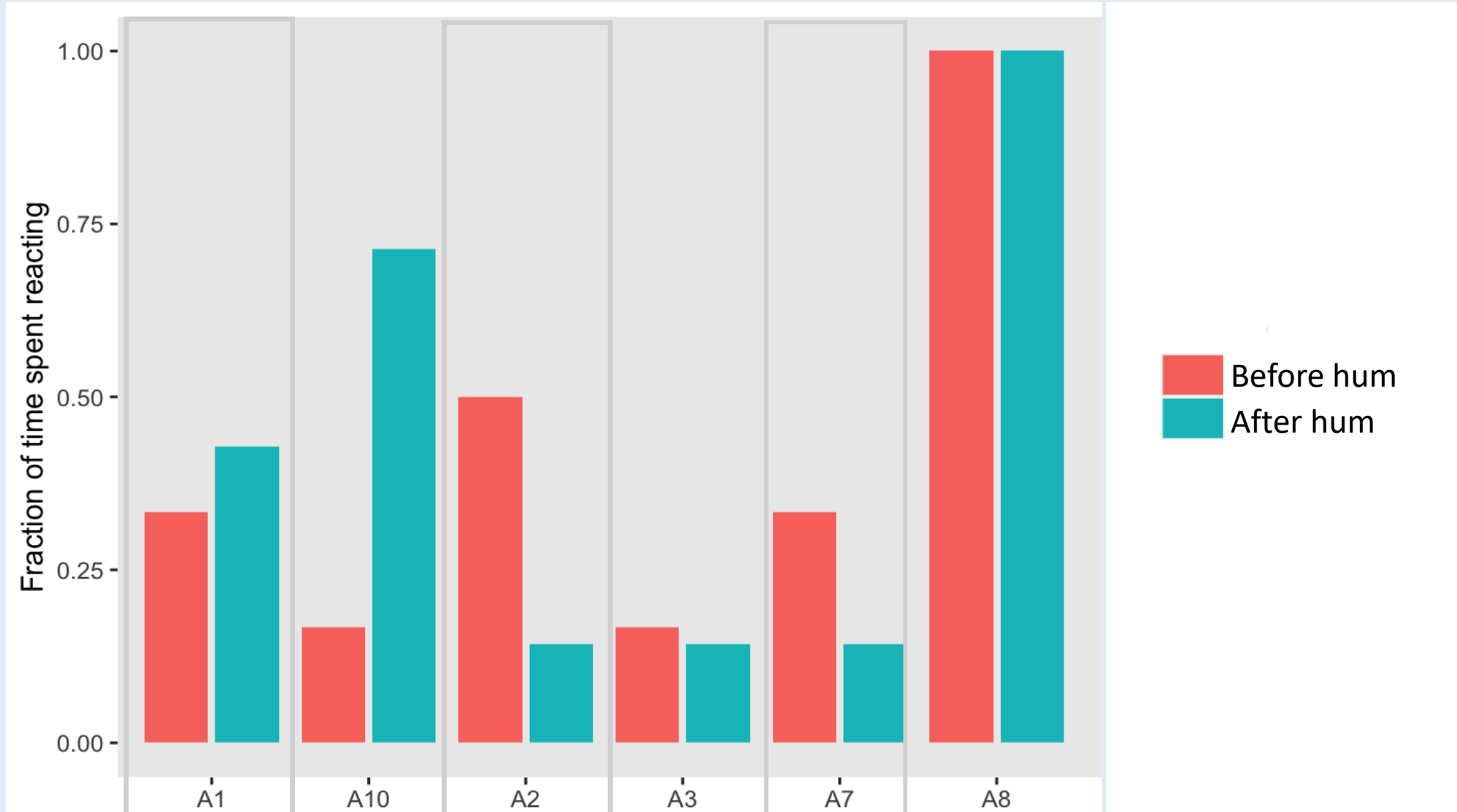


Adapted from Atema & Karavanich, 1998

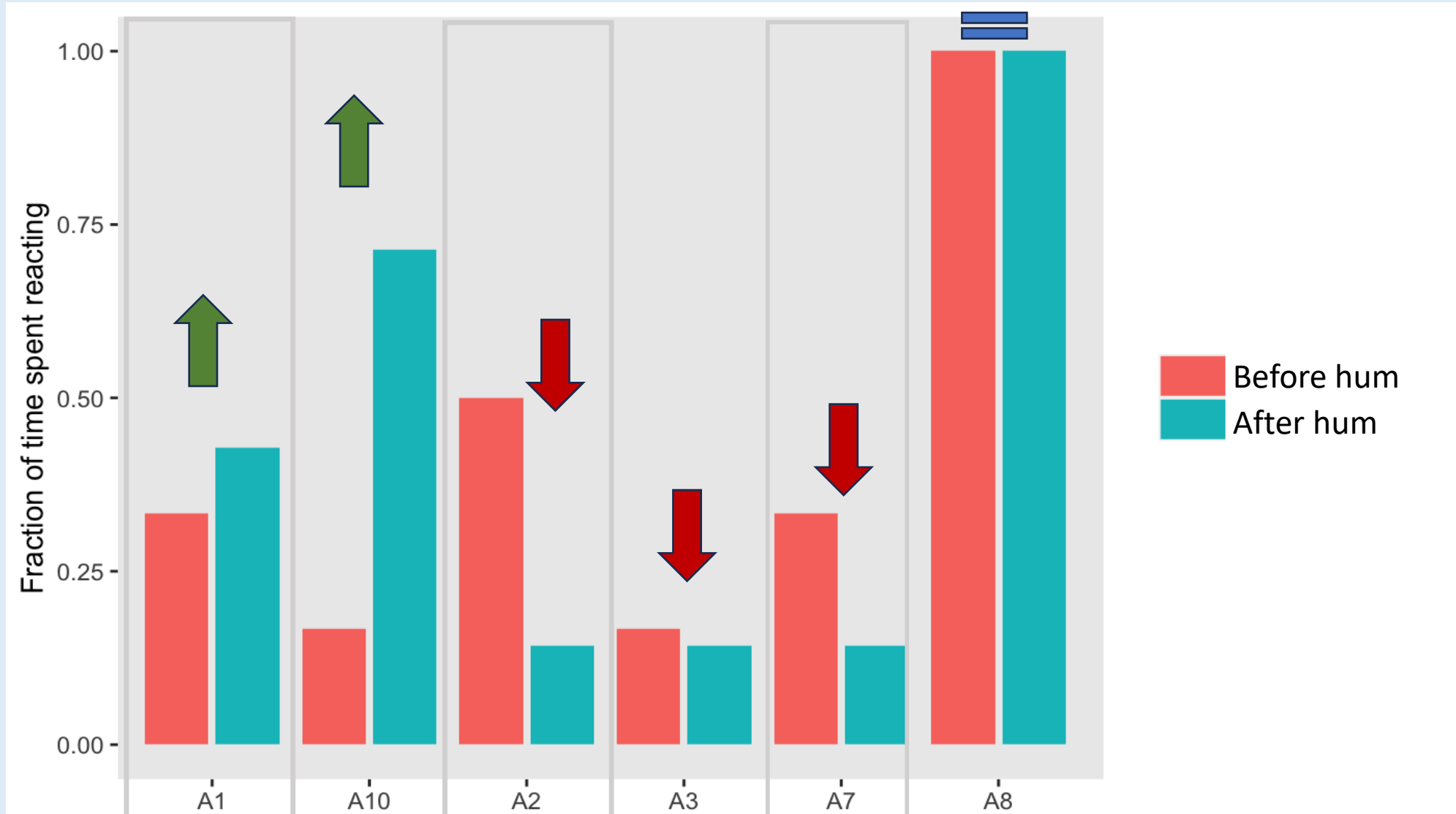
2. Playback experiment



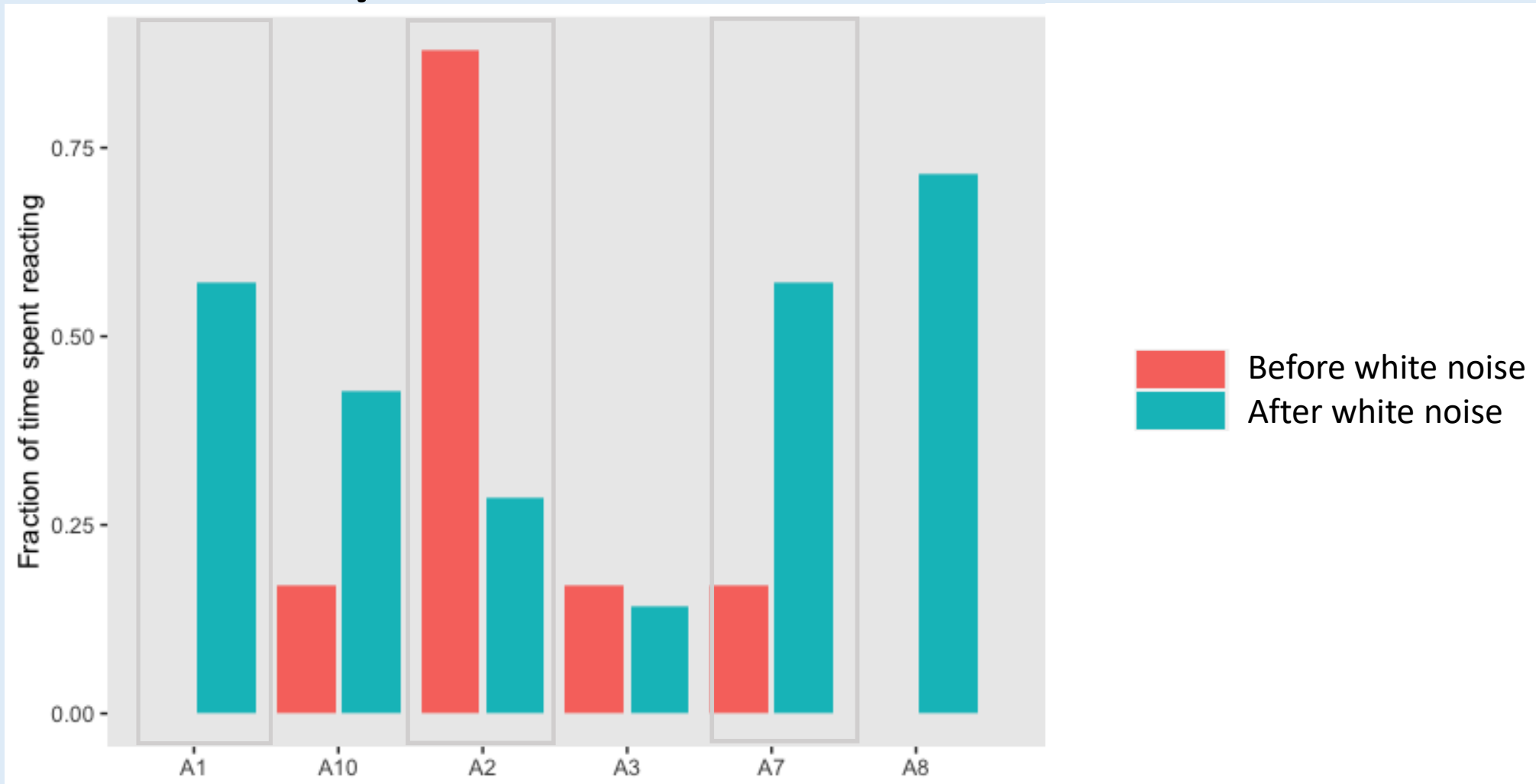
Tentative results: Lobsters did not respond to hums.



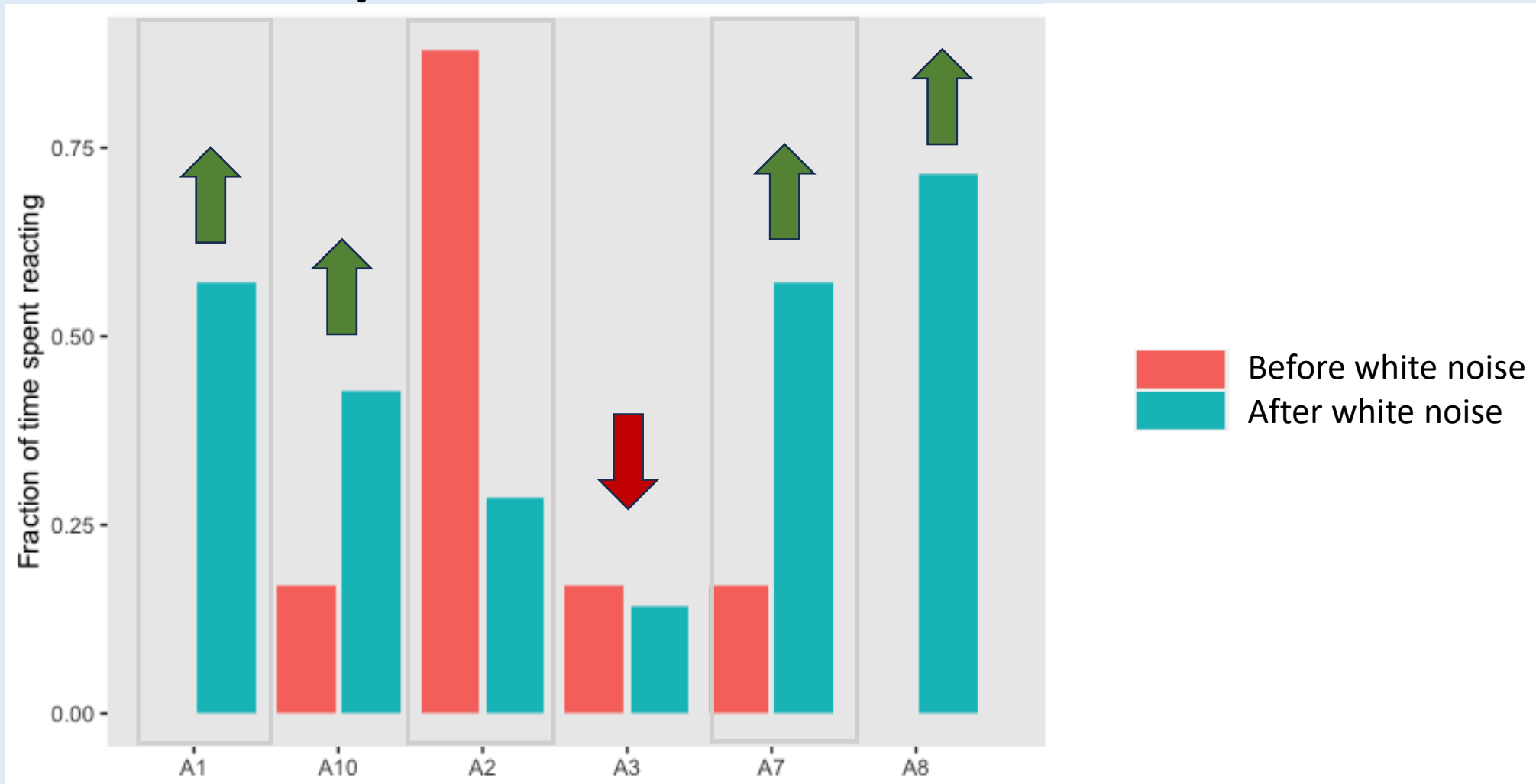
Tentative results: Lobsters did not respond to hums.



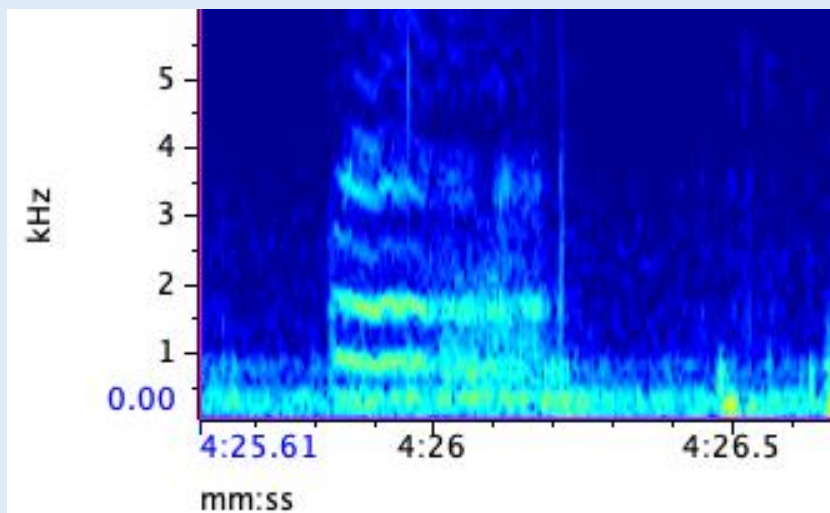
Tentative results: Lobsters responded more noticeably to white noise.



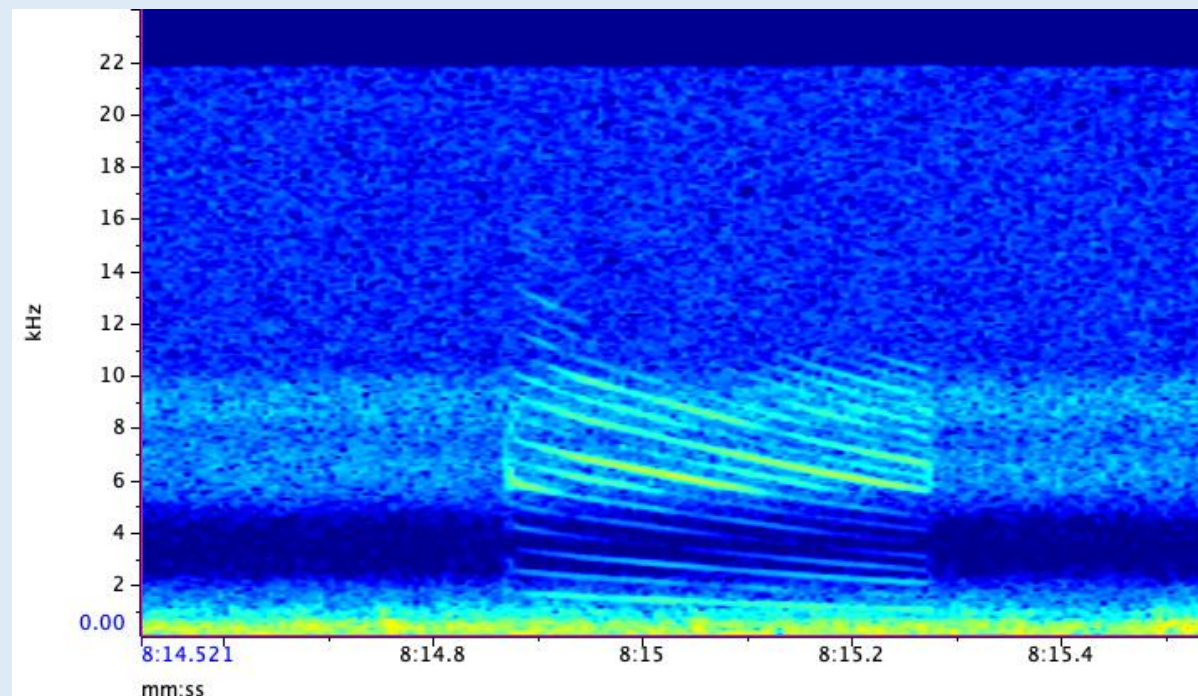
Tentative results: Lobsters responded more noticeably to white noise.



3. High-pitched sounds observed



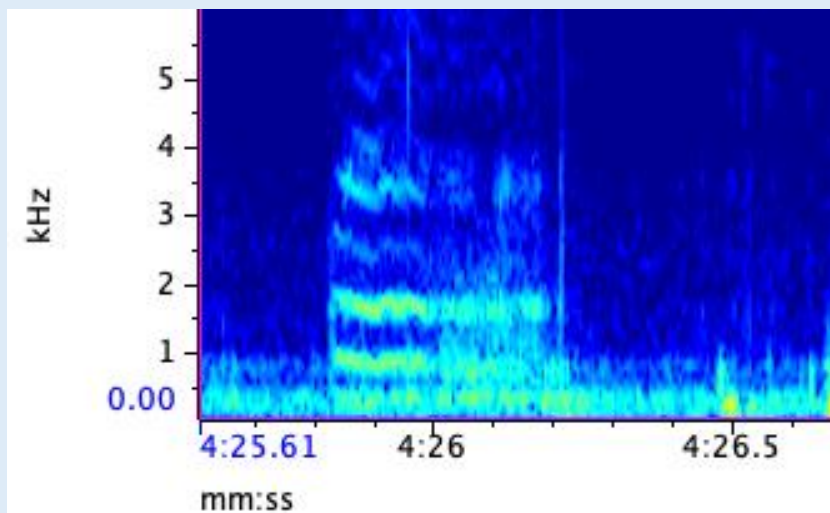
November 2022



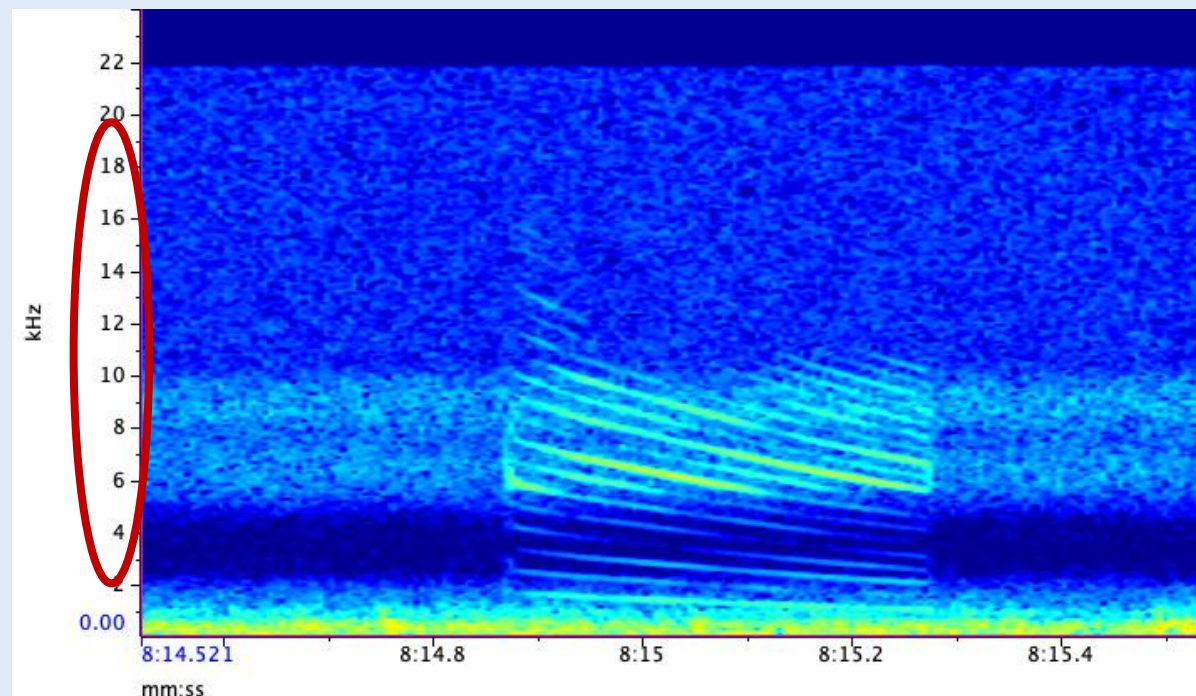
August 2023



3. High-pitched sounds observed



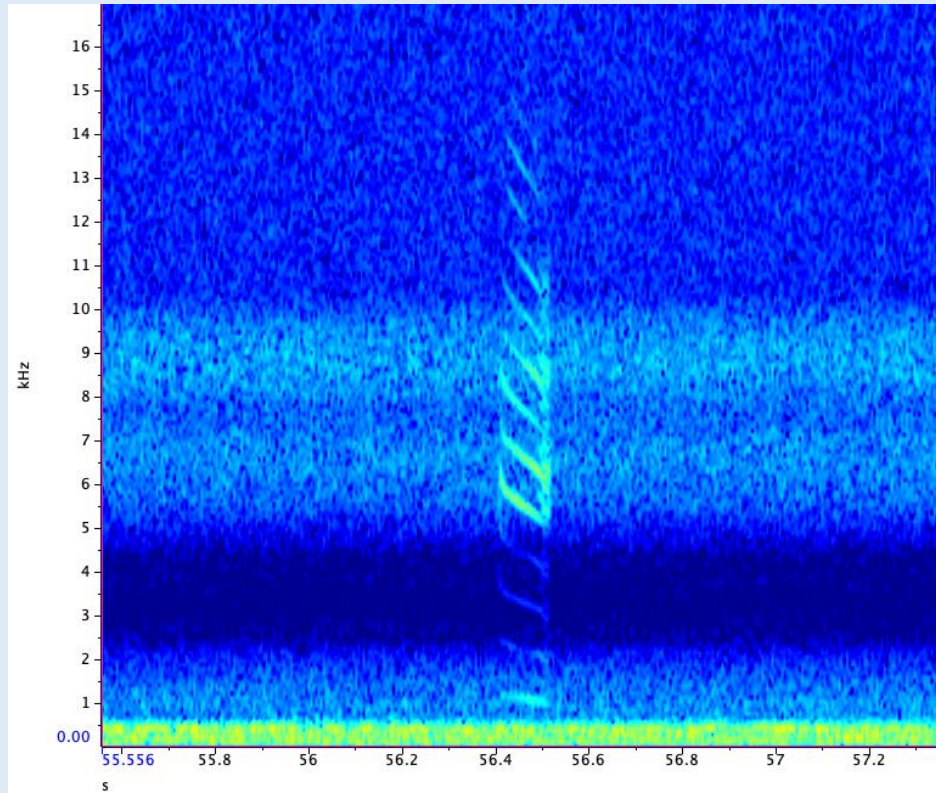
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August 2023



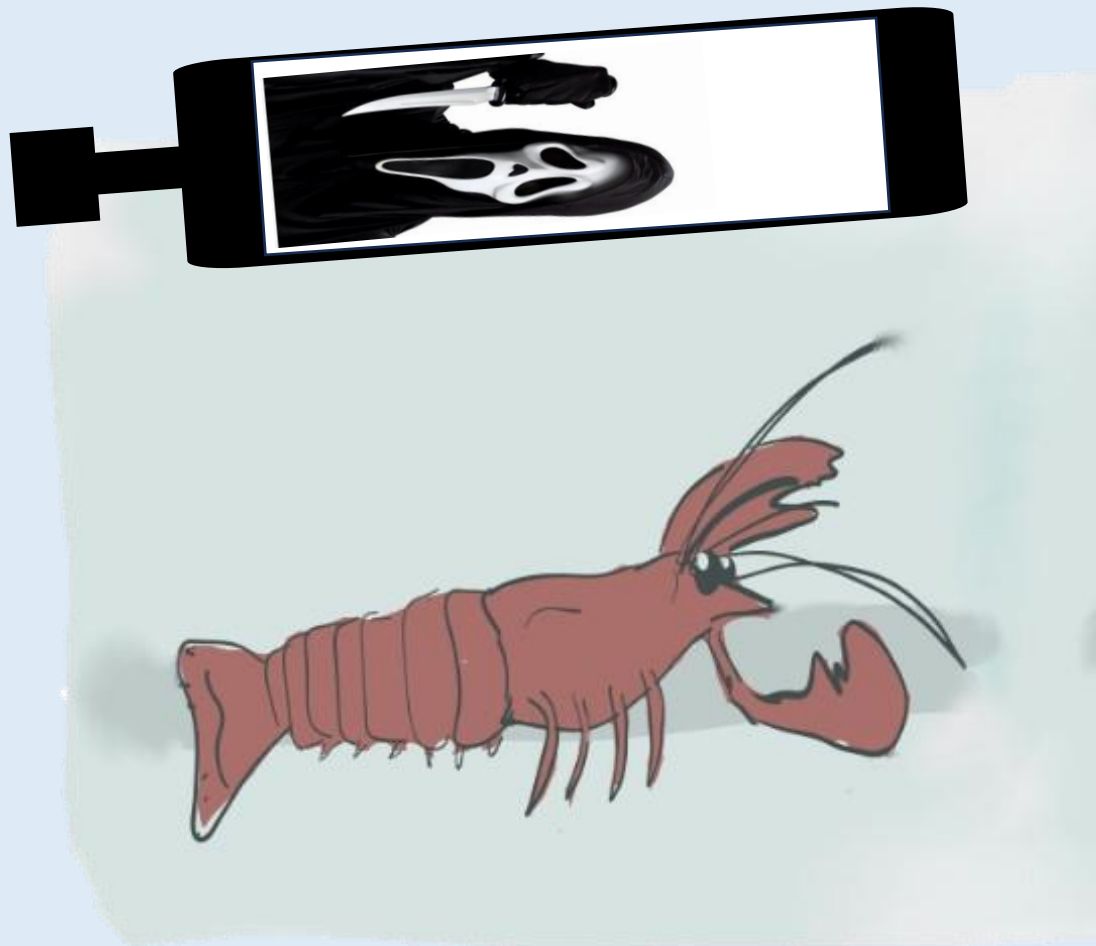
3. High-pitched sounds observed



4. Current work: *how do you make a lobster go 'squeak'?*



Scary movies?





Questions?

Thank you to:

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My summer research group

BMSS professors and students

Schiller Coastal Studies center staff



References

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