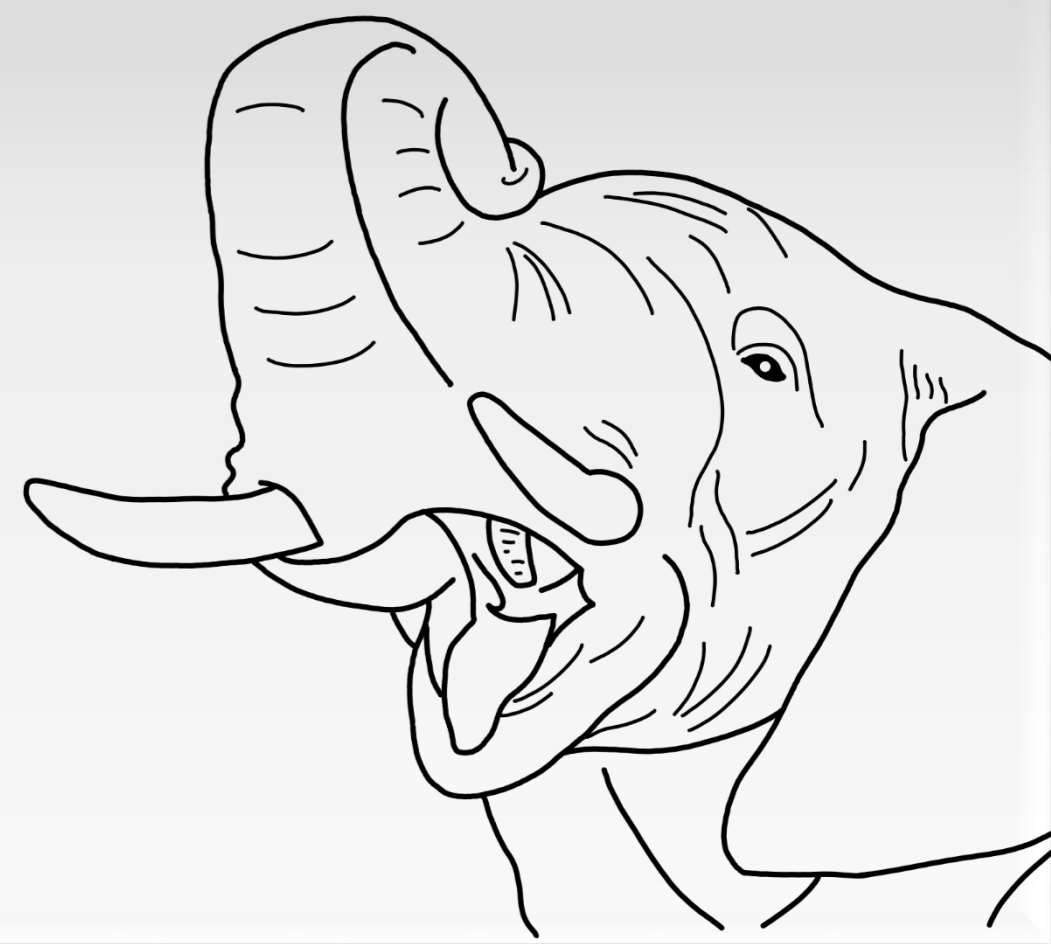


Pilot study on the possible effect of sound and vibrations on African elephants (*Loxodonta africana*) welfare and behaviour



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OBJECTIVES

Due to the need to demolish the dolphinarium at Barcelona Zoo, this study was conducted to determine the possible effect that sounds and vibrations generated by construction work could have on African elephants.

RESULTS

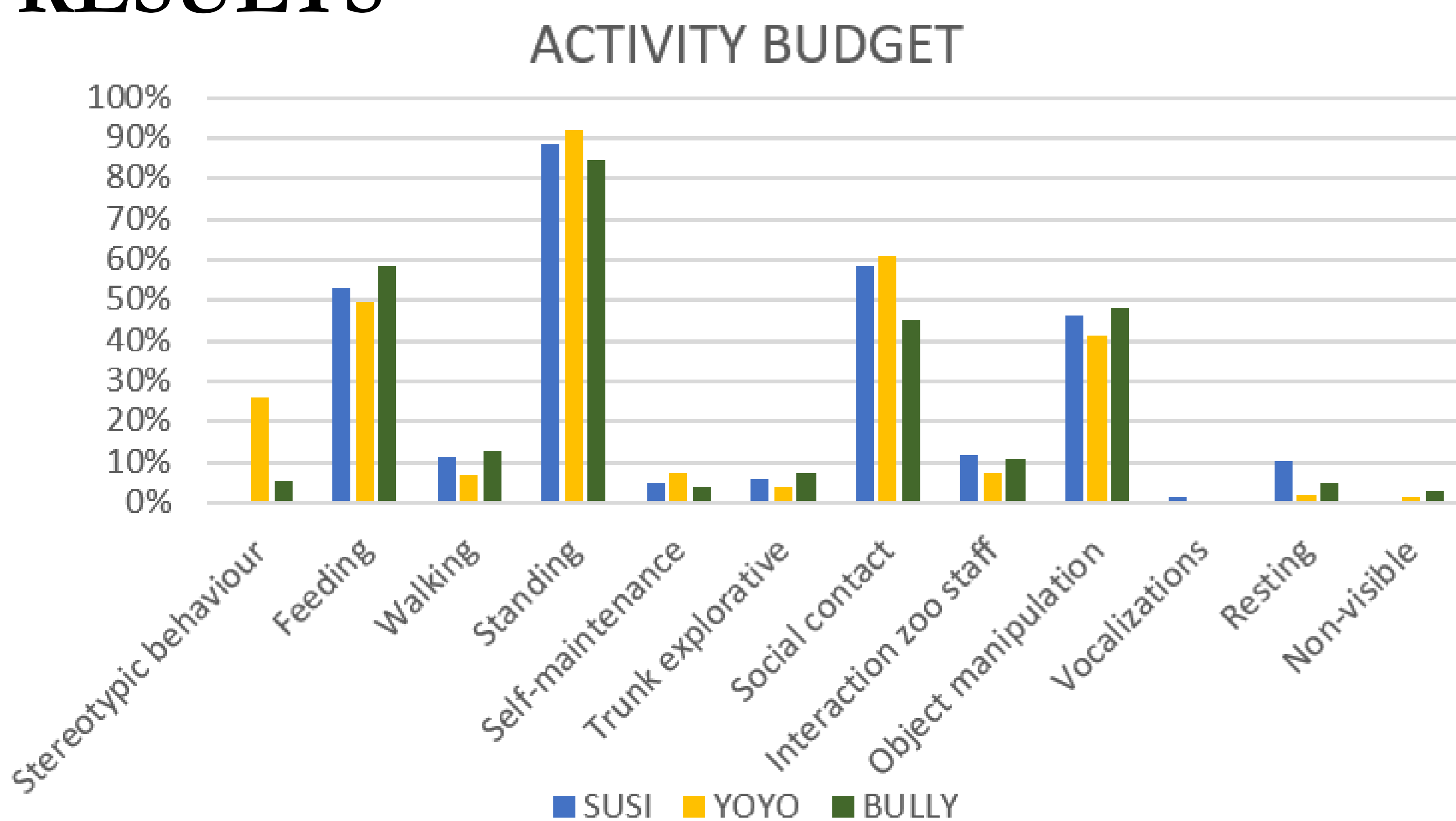


Figure 1. Activity budget of the three female African elephants living at Barcelona Zoo.

MATERIALS & METHODS

An ethogram was elaborated to record the elephants behaviour, and a total of 69 hours of direct observation were registered. Simultaneously, two seismic stations were placed around the enclosure's perimeter to collect seismic and infrasound signals present in the area.

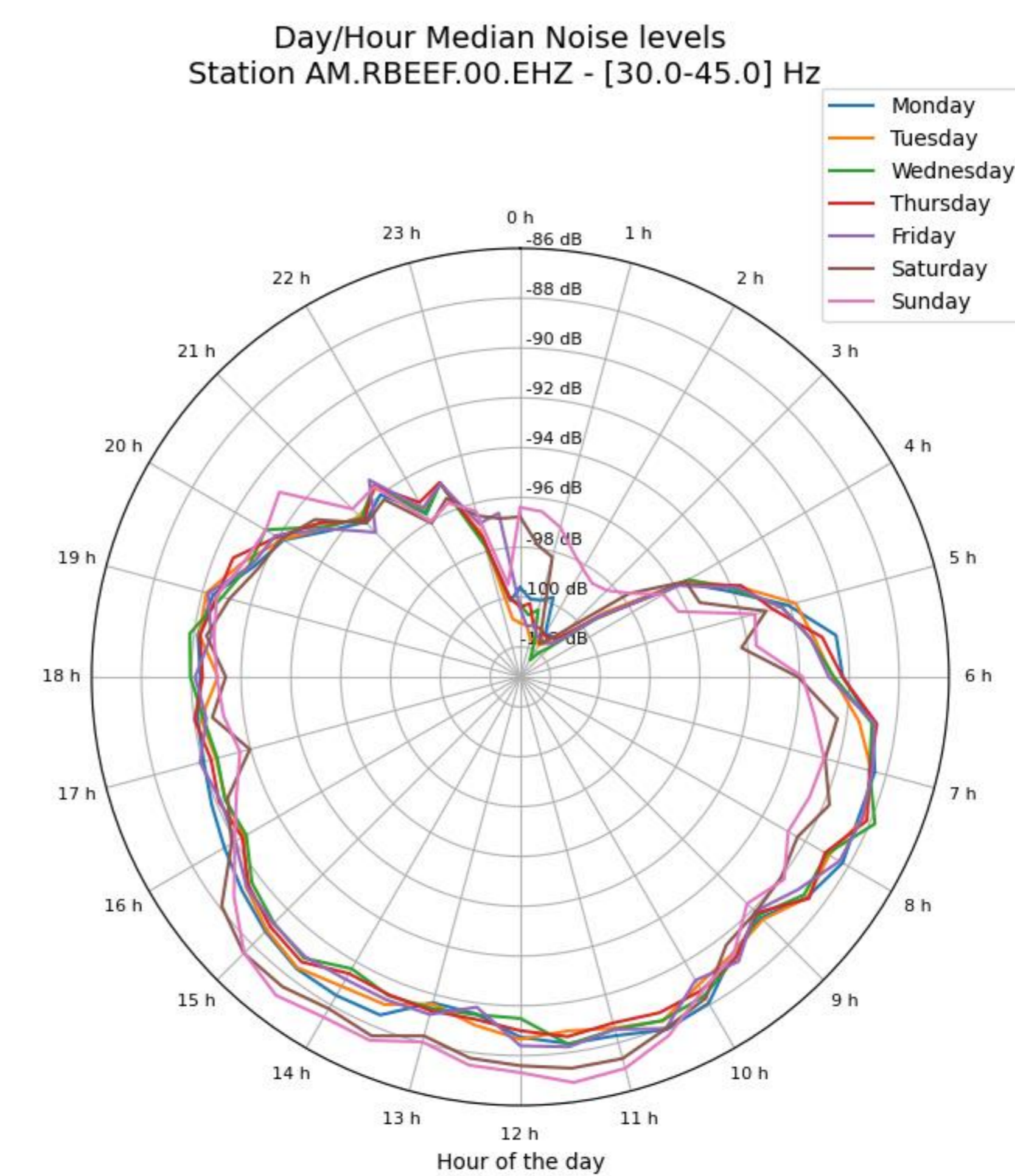


Figure 2. Representation of noise levels per hour each day of the week (from Oct. 2022, to May, 2023; UTC). Each line represents the median amplitude (dB) registered in the 30.0 – 45.0 Hz bandwidth.

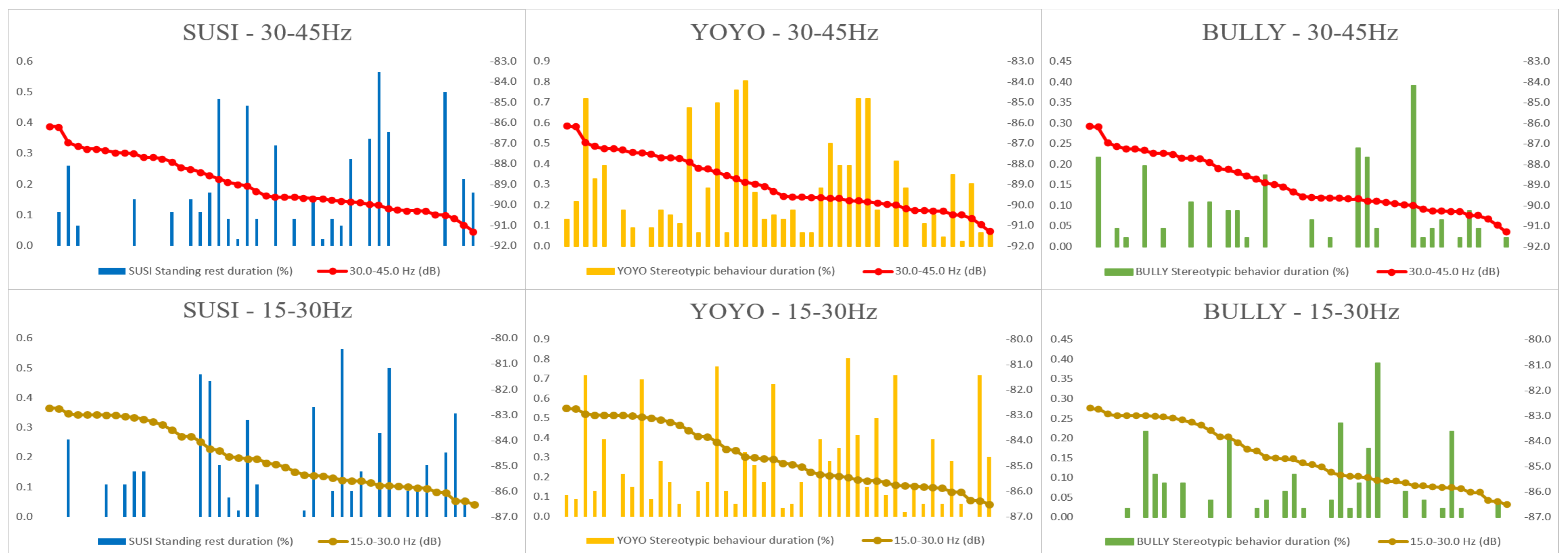


Figure 3. Visual representation of mean amplitude values (dB) registered for each session of observation, ordered from major to minor (dotted line), and compared with Susi, Yoyo & Bully's selected repetitive behaviours (represented in columns). On the left, for the 30.0-45.0 Hz bandwidth. On the right, for the 15.0-30.0 Hz bandwidth. Spearman coefficients among these variables showed little to no correlation, indicating a possible lack of sufficient data.

CONCLUSIONS

1. Traditional observational methods are not useful to demonstrate the possible effect of sound and vibrations on captive African elephants welfare and behaviour. To establish a correlation, further studies involving AI cameras would be needed.
2. The animals are exposed to continuous auditory pollution and seismic signal noise. Due to its possible negative impact on welfare, this topic should be assessed.
3. Stereotypic behaviour observed cannot be disregarded. Future studies should lead to a better understanding of its origins.