

Are mating preferences further structuring the population of Lahille's bottlenose dolphins that forage with fishers?

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The estuarine waters of Laguna, southern Brazil, is inhabited by a small and highly resident Lahille's bottlenose dolphin (*Tursiops truncatus gephyreus*) population (n = 53-60) (Daura-Jorge et al., 2013). We have previously observed distinct behavior preferences associated with foraging tactics, which are shaping the social structure of this population (Machado et al. 2019). Considering that social structure and philopatry can drive genetic differentiation over a small spatial scale, in this study we aimed to investigate: (1) whether social preferences are influencing the mating preferences of the resident dolphins of the Laguna estuary and leading to genetic structure; (2) what is the genetic relationship among dolphins within the estuary; and (3) the connectivity between Laguna resident estuarine dolphins and non-resident dolphins from adjacent coastal waters. We successfully extracted and genotyped for 15 microsatellite loci the DNA of 45 bottlenose dolphins from our study-area. Among these samples we had a total of 31 dolphins that were identified as belonging to the resident population of Laguna, while the other 14 were considered as non-residents. Of these 31 dolphins of Laguna, 16 were considered as displaying (at varying frequencies) the foraging tactic that involves the interaction with artisanal fishers (Simões-Lopes et al., 1998), while the others were not observed interacting with the fishers. Our clustering analysis (STRUCTURE; Pritchard et al., 2010) detected the presence of two genetic clusters, which correspond to the two subspecies of *T. truncatus* found in the western South Atlantic (Costa et al. 2016; 2021): *T. t. gephyreus* (N = 39) and *T. t. truncatus* (N = 6). The *gephyreus*-cluster included all the resident dolphins from the Laguna population (independent of their foraging preference) and Lahille's dolphins considered as non-residents. We observed a high number of highly related individuals within the *gephyreus*-cluster, independent of their level of residency and preference of foraging tactic. No further genetic structure was observed when considering only the samples in the *gephyreus*-cluster. These preliminary findings indicate that social preferences are not influencing the mating preferences of the resident dolphins of the Laguna estuary. In other words, the social structure observed among dolphins of this population has not reflected in a genetic structure. Interestingly, we did not observe a genetic differentiation between resident and non-resident Lahille's dolphins of adjacent waters. This observation suggests that the resident dolphins of Laguna might not form such an isolated population as previously thought (see Fruet et al. 2014). However, there is still a need to further investigate the genetic connectivity between resident dolphins from Laguna with a bigger sample size of non-residents, including those further away from the mouth of the estuary. This is a project that is currently ongoing and conducted by our research group. The lack of genetic structure within the Laguna resident population and the possible presence of gene flow from non-resident dolphins can positively impact the Laguna population viability

by reducing inbreeding. This connectivity is extremely important when considering the already low level of genetic diversity in this group (Costa et al., 2021). The continuation of our genetic study, increasing the sample size and broadening the range of our non-resident samples, will allow us to better formulate management strategies for these dolphins. We thank the Society for Marine Mammalogy for awarding us the Small Grant-in-Aid, which allowed us to initiate this study. The funding provided was used to purchase the necessary reagents and material to conduct our genetic analyses.

References

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