

Final Report

**Systematic, ontogeny and paleobiology of *Prosqualodon australis* (Cetacea: Odontoceti) from the early Miocene of Patagonia (Argentina)**

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The current project is part of my PhD, which is focused in the systematic, ontogeny and paleobiological aspects of the fossil odontocetes *Prosqualodon australis*. This is a small to medium size dolphin characterized for having a short rostrum with large heterodont and highly sculpted teeth that lived in the coasts of the Argentinian Patagonia. It was several times allied with the superfamily Platanistoidea, but recently this species has been interpreted as a stem-Odontoceti. The inclusion of new findings, skulls and the still undescribed periotic and tympanic bulla, in a new phylogenetic analysis could give a more accurate idea of its relationships, which is one of the main objectives of the whole project. Another of the core objectives is to assess the hearing capability of *P. australis*. During the progress of this research project, the grant obtained from the Society for Marine Mammalogy was specially used to carry out this objective. Recently, we performed a tridimensional reconstruction from CT-scans of the inner ear of *Prosqualodon australis* and other related platanistoids. The processing of CT-scan images and 3D models, requires a computer with high processing speeds. The funds obtained from the Society for Marine Mammalogy was used to acquire the necessary equipment (desktop computer, monitor and graphic tablet) for generating and manipulation of the 3D models of the inner ears of this species. Due to the COVID-19 crisis and still ongoing lockdown, I was not able to perform all the CT scans nor museum visits planned on the proposed timeline that would allow me to perform the planned analyses. We hope to perform that as soon as possible. The results of the study of the cochlear morphology of *P. australis*, recently published in the scientific journal *Paleobiology*, showed that the shape of the cochlea is like that of other stem odontocetes, with a tight coil and being relatively tall. Also, even if its function is still unknown, a conspicuous tympanal recess was identified in the cochlea of this species. The estimation of the low frequency hearing limit (LFL) showed that *P. australis* has the higher LFL among the Patagonian fossil odontocetes by now. In a broader sense, and having in mind the still problematic phylogeny of *P. australis*, the superfamily Platanistoidea as a whole, does not seem to have a representative cochlea morphology, since it varies a lot among the species. On the other hand, *Platanista gangetica* has the more derived cochlear morphology of the superfamily.