Dataset

Supplemental information for "Sensory anatomy of the most aquatic of carnivorans: the Antarctic Ross seal, and convergences with other mammals"

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Abstract
Here, the semicircular canals of the most aquatic seal, the rare Antarctic Ross Seal (*Ommatophoca rossii*), are presented for the first time, along with representatives of every species in the Lobodontini: the leopard seal (*Hydrurga leptonyx*), Weddell seal (*Leptonychotes weddellii*), and crabeater seal (*Lobodon carcinophagus*). Because encounters with wild Ross seal are rare and few specimens are available in collections worldwide, this dataset increases accessibility to a rare species. For further comparison, we present the bony labyrinths of other carnivorans, the elephant seal (*Mirounga leonina*), harbor seal (*Phoca vitulina*), walrus (*Odobenus rosmarus*), South American sea lion (*Otaria byronia*).

Keywords: aquatic, inner ear, *Ommatophoca rossi*, *Phoca*, semicircular canals

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INTRODUCTION

Marine mammals repeatedly converge on similar body shapes, but convergences in sensory systems are less well documented. Here we explore the convergences in the sensory anatomy of the Ross seal (*Ommatophoca rossii*) and compare with carnivorans including true seals (*Hydrurga leptonyx*, *Lobodon carcinophagus*, Leptonychotes weddellii), walrus (Odobenus rosmarus), and otter (Otaria byronia). Bony labyrinths of the species cited above are presented here (Fig. 1 and table 1). This publication accompanies "Sensory anatomy of the most aquatic of carnivorans: the Antarctic Ross seal, and convergences with other mammals"(Loza et al., 2017).

METHODS

The Lobodontini specimens and all South American taxa were scanned using MRI (Magnetic Resonance Imaging), the harbor seal was scanned at the University of Zurich in the Anthropological Institue, using a Nikon X TH 2255T in the Anthropological department at the University of Zurich., and the walrus scan was obtained from Digimorph (Ekdale, 2006). The 3D surfaces were extracted using VG StudioMax 2.2 (https://www.volumegraphics.com/ Volume Graphics, Heidelberg, Germany) and Mimics (http://biomedical.materialise.com/mimics; Materialise, Leuven, Belgium) after either manual or semi-automatic region selection. They were post-processed using MeshLab to remove isolated pieces, merge close vertices, remove non-manifold edges and vertices, remove unreferenced vertices, and close holes. Where the files were unnecessarily large, they were also optimized in MeshLab (http://meshlab.sourceforge.net) using Laplace smoothing and quadratic edge decimation. The surfaces can be opened and viewed using MeshLab, Blender (http://blender.org; Stitching Blender Foundation, Amsterdam, the Netherlands), or any programs with support of .ply format files.

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Ekdale E. 2006. *Odobenus rosmarus* [Internet]. Digit. Morphol. Available from: http://digimorph.org/specimens/Odobenus_rosmarus/adult/

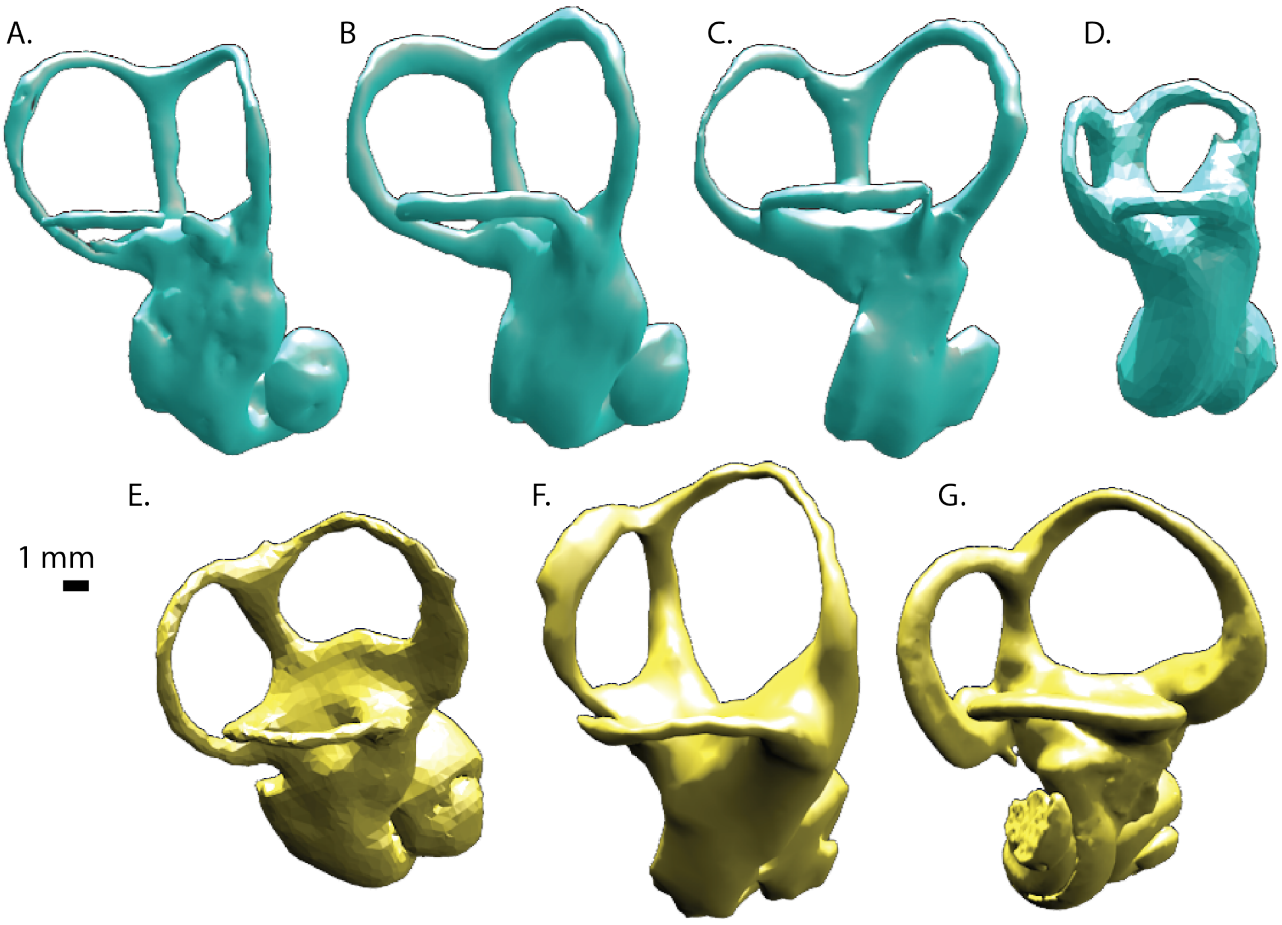

Figure 1. Bony labyrinths in lateral view of A. *Hydrurga leptonyx* B. *Leptonychotes weddellii,* C. *Lobodon carcinophagus,* D. *Ommatophoca rossii,* E. *Odobenus rosmarus,* F. *Mirounga leonia,* G. *Phoca Vitulina.* Scale bar is 1mm.

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Inventory nr.	Taxon	Common name	Collection
MVZ125566	*Odobenus rosmarus*	Walrus	The museum of Vertebrate Zoology at Berkeley
UZNH17973	*Phoca vitulina*	Harbor seal	Zürich Zool. Museum
MLP14.IV.48.11	*Hydrurga leptonyx*	Leopard seal	Museo de La Plata
IAA02-13	*Leptonychotes weddellii*	Weddell seal	Instituto Antártico Argentino
IAA530	*Lobodon carcinophagus*	Crabeater seal	Instituto Antártico Argentino
MACN48259	*Ommatophoca rossii*	Ross seal	Museo de Ciencias Naturales Bernardi
IAA03-5	*Mirounga leonina*	Elephant seal	Instituto Antártico Argentino

Table 1. Table 1. Specimens included in the contribution.

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