

**FROM HIND LIMBS TO GIANT TEETH AND LONG SNOUTS, AND FROM
BALEEN TO GUT CONTENTS: RECENT CONTRIBUTIONS FROM THE EAST
PISCO BASIN TO CETACEAN EVOLUTION IN THE SOUTHEASTERN PACIFIC**

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For more than four decades, the study of the marine deposits of the East Pisco basin (southern coast of Peru) has led to the description of a large number of extinct marine mammals from the Paleogene and Neogene, revealing the existence in the past of surprising creatures, like the marine sloth *Thalassocnus* and the walrus-like dolphin *Odobenocetops*.

The last fifteen years have seen further integration for the marine mammal studies in that basin, being gradually coupled with detailed investigations in fields ranging from

sedimentology to taphonomy, and from chronostratigraphy to geochemistry, which are ultimately leading to a better understanding of the temporal framework and paleoenvironments of the discovered taxa, as well as the taphonomic processes underlying the exquisite preservation of so many marine vertebrate remains. Whereas earlier works focused predominantly on the extremely rich late Miocene levels of the Pisco Formation, an increased prospection effort and the organization of several larger-scale, multidisciplinary field campaigns targeting geologically older deposits in the basin revealed the great potential of several localities for the middle Miocene part of the Pisco Formation, the lower Miocene Chilcatay Formation, and the middle to upper Eocene Paracas Formation.

From a paleobiogeographic viewpoint, new finds provided clues about the early dispersal of quadrupedal whales in the Pacific and Southern Hemisphere, and antitropical distribution of late Miocene beaked whales. Other discoveries shed new light on key steps of the evolutionary history of cetaceans, including the earliest mysticete, the late Eocene *Mystacodon*, and records of early members of the clades Cetotheriidae (middle Miocene *Tiucetus*) and Physeteroidea (early Miocene *Rhaphicetus*). Previously unknown feeding strategies and cranial morphotypes were revealed, including evidence of evolution towards suction feeding in the tooth-bearing *Mystacodon*, a unique feeding strategy for the cetotheriid *Piscobalaena* (suggested by the extent of the fossilized baleen rack on its narrow rostrum), a great disparity of rostrum shapes in early Miocene platanistoids, and macroraptorial sperm whales with proportionally large teeth and robust jaws (e.g. the giant *Livyatan*). Finally, rare cases of fossilized digestive tract contents (for the basilosaurid *Cynthiacetus*, a large-sized cetotheriid, and the beaked whale *Messapicetus*), as well as shark bite marks on cetacean bones (including *Piscobalaena*), yielded valuable insights on local trophic networks.

More fragmentarily preserved specimens in the collection of the MUSM (Lima) and preliminary prospection in new localities suggest that the East Pisco basin is still far from having revealed all its marine mammal treasures.