

Intraspecific variation in cranial and mandibular morphology of the extinct river dolphin *Parapontoporia sternbergi* from the upper Pliocene San Diego Formation, southern California, USA

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Parapontoporia sternbergi is an extinct species of river dolphin. It has been distinguished from two closely related extinct species, *Parapontoporia pacifica* and *Parapontoporia wilsoni*. These differences served as a basis for the establishment of *P. sternbergi* as a separate species. This study tests the validity of recognizing *P. sternbergi* as a distinct species based on examination of intraspecific variation in the cranial and mandibular morphology of fossil specimens.

This study utilized specimens from collections at the San Diego Natural History Museum and the Natural History Museum of Los Angeles County. Specimens included 3 complete skulls of *P. sternbergi* and 13 complete skulls of the closely related river dolphin, *Pontoporia blainvillei*. The skull characters that define *P. sternbergi* as a species were identified as regions of focus. Variations of these characters are quantified by the following 15 skull measurements: left and right zygomatic process length, neurocranium width and length, left and right temporal fossa width, left and right temporal fossa height, left and right orbital length, width of rostrum at base, rostrum length, zygomatic width, width of rostrum at midpoint, and total length. Measurements were taken on each of the 16 specimens.

For each of the skull measurements, mean measurements were calculated for *P. sternbergi* (n=3) and *P. blainvillei* (n=13). Separate t-tests were conducted (1 for each skull measurement), testing for a significant difference between the *P. sternbergi* and *P. blainvillei* means. Each *P. sternbergi* mean measurement was tested against the corresponding mean measurement on *P. blainvillei*. The 2-sample t-tests revealed that 9 of the 15 skull measurements resulted in p-values less than 0.05. This indicates that more than half of the skull characters of *P. sternbergi* are significantly different from those of *P. blainvillei*, suggesting that there are significant morphological differences in both river dolphins, supporting their recognition as separate species.