

THE DWARFING OF HIPPOPOTAMI ON CYPRUS

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Islands provide startling examples of evolution and have inspired both Charles Darwin and Alfred Russel Wallace. A notable example is hippopotami (or hippos). Many hippo fossils have been found on the Mediterranean islands, Madagascar, and Java. Body size of these insular hippos decreased after colonisation of the island, so that they were dwarfed compared to their mainland ancestors. The Cypriot dwarfed hippo (*Phanourios minor*) is the smallest dwarfed hippo ever to have roamed the earth. Its growth and life history have never been studied, however. Through histologic analyses of the long bones, it is demonstrated that the growth trajectory of the Cypriot dwarfed hippo was unlike that of any other mammal. In utero, growth was extremely slow, whereas initial postpartum growth displays the normal mammalian pattern. Then, there is a sudden decrease in growth rate, including the formation of up to 21 yearly lines of arrested growth. As natural resources were scarce on Cyprus during the Pleistocene, we propose that, post-weaning, dwarfed Cypriot hippos were straining to gather enough sustenance. This affected not only juvenile and sub-adult growth rates, but also foetal growth, as the foetus is dependent on its mother for nutrition. Infant growth rate of Cypriot dwarfed hippos follows the normal mammalian pattern. Modern hippo calves often suckle with multiple females. We postulate that Cypriot dwarfed hippo calves behaved similarly, but would have had to suckle with more females than modern hippos do, because the physical condition of Cypriot dwarfed hippos would not have allowed for much milk production per individual female. Reduced foetal growth rate has not been described in any other mammal and demonstrates a previously unknown flexibility with which the mammalian body is able to respond to extreme environmental conditions.