The Laptev Sea walrus *Odobenus rosmarus laptevi*: an enigma revisited

Charlotte Lindqvist, Lutz Bachmann, Liselotte W. Andersen, Erik W. Born, Ulfur Arnason, Kit M. Kovacs, Christian Lydersen, Alexei V. Abramov & Øystein Wiig

Submitted: 25 March 2008
Accepted: 24 August 2008
doi:10.1111/j.1463-6409.2008.00361.x

Lindqvist, C., Bachmann, L., Andersen, L. W., Born, E. W., Arnason, U., Kovacs, K. M., Lydersen, C., Abramov, A. V. & Wiig, Ø. (2008). The Laptev Sea walrus *Odobenus rosmarus laptevi*: an enigma revisited. — *Zoologica Scripta, 38*, 113–127.

The walrus (*Odobenus rosmarus*) is in some current systematic schemes divided into three subspecies: *O. r. rosmarus* in the North Atlantic, *O. r. divergens* in the North Pacific and *O. r. laptevi* in the Laptev Sea. These three subspecies have been described as differing in body size, but the taxonomic status of *O. r. laptevi* is disputed. The current study applies molecular and morphometric methods to assess the taxonomic status of *O. r. laptevi* and to analyse the systematic and phylogeographic relationships between the three purported walrus subspecies. Tusk length and tusk circumference were measured from the few skulls available of *O. r. laptevi*, and the obtained values were within the ranges reported for Pacific walruses. Thus, morphologically, subspecies status for *O. r. laptevi* is not supported according to the Amadon–Mayr '75% rule'. Phylogenetic analyses and haplotype networks based on mitochondrial nucleotide sequence data of NADH dehydrogenase 1, 16S rRNA, cytochrome oxidase I and the D-loop of the control region of the historic *O. r. laptevi* bone material and contemporary *O. r. rosmarus* and *O. r. divergens* showed that the Laptev Sea walrus groups with individuals from the North Pacific. Thus, the mitochondrial sequence data do not support the recognition of three walrus subspecies as reciprocally monophyletic evolutionary units with independent evolutionary histories. Only *O. r. rosmarus* and *O. r. divergens* meet this criterion with the present sampling. Accordingly, we recommend that *Odobenus r. laptevi* be abandoned and the Laptev walrus instead be recognized as the westernmost population of the Pacific walrus, *Odobenus r. divergens*. However, further research is recommended to assess whether the Laptev walrus could be considered as a significant unit in terms of conservation and management, since it is unique in several ecological parameters.

Corresponding author: Øystein Wiig, Charlotte Lindqvist and Lutz Bachmann, Natural History Museum, Department for Zoology, University of Oslo, PO Box 1172 Blindern, NO-0318 Oslo, Norway. E-mails: oystein.wiig@nhm.uio.no, cl74@buffalo.edu, lutz.bachmann@nhm.uio.no
Present address for Charlotte Lindqvist, Department of Biological Sciences, The State University of New York at Buffalo, Buffalo, NY 14260, USA
Liselotte W. Andersen, Department of Wildlife Ecology and Biodiversity, National Environmental Research Institute, University of Aarhus, Grenåvej 14, DK-8410 Rønde, Denmark. E-mail: lwa@dmu.dk
Erik W. Born, Greenland Institute of Natural Resources, PO Box 570, DK-3900 Nuuk, Greenland. E-mail: ewb@ghsdk.dk
Ulfur Arnason, Division of Evolutionary Molecular Systematics, University of Lund, Sölvegatan 29, S-223 62 Lund, Sweden. E-mail: ulfur.arnason@cob.lu.se
Kit M. Kovacs, Christian Lydersen, Norwegian Polar Institute, N-9296 Tromsø, Norway. E-mails: kit.kovacs@npolar.no, christian.lydersen@npolar.no
Alexei V. Abramov, Laboratory of Mammals, Zoological Institute, Russian Academy of Sciences, Universitetskaya nab., 1, Saint Petersburg, 199034, Russia. E-mail: a.abramov@mail.ru

Introduction

The walrus (*Odobenus rosmarus*) has a circumpolar distribution in the Arctic. Three subspecies are currently recognized. *Odobenus rosmarus rosmarus* is distributed in the North Atlantic and *O. r. divergens* is distributed in the North Pacific (Fay 1981). The third subspecies, *O. r. laptevi* from the Laptev

 •