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<AT>Putative origin and maternal relatedness of male sperm whales (*Physeter macrocephalus*) recently stranded in the North Sea

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<ABS-HEAD>Abstract

<ABS-P>The globally distributed sperm whale (*Physeter macrocephalus*) has a partly matrilineal social structure with predominant male dispersal. At the beginning of 2016, a total of 30 male sperm whales stranded in five different countries bordering the southern North Sea. It has been postulated that these individuals were on a migration route from the north to warmer temperate and tropical waters where females live in social groups. By including samples from four countries (n=27), this event provided a unique chance to genetically investigate the maternal relatedness and the putative origin of these temporally and spatially co-occurring male sperm whales. To utilize existing genetic resources, we sequenced 422bp of the mitochondrial control region, a molecular marker for which sperm whale data are readily available from the entire distribution range. Based on four single nucleotide polymorphisms (SNPs) within the mitochondrial control region, five matrilineal lineages could be distinguished within the stranded specimens, four of which matched published haplotypes previously described in the Atlantic. Among these male sperm whales, multiple matrilineal lineages co-occur. We analyzed the population differentiation and could show that the genetic diversity of these male sperm whales is comparable to the genetic diversity in sperm whales from the entire Atlantic Ocean. We confirm that within this stranding event, males do not comprise maternally related individuals and apparently include assemblages of individuals from different geographic regions.

<KWD>Keywords: mitochondrial DNA; maternal relationships; population genetics; migration; marine mammals

Despite their high mobility, wide ranging cetaceans often exhibit geographically restricted migration patterns, leading to population structure both among and within ocean basins. Isotope analysis (Borrell et al., 2013; Matthews et al., 2016; Valenzuela et al., 2009), acoustic data (Gero et al., 2016; Rendell and Whitehead, 2004), pollution information (Aguilar et al., 2002; Godard-Coding et al., 2011; Mazzariol et al., 2011), morphological differences (Bolaños-Jiménez et al., 2014; De Luna et al., 2012; Durban

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