

# GENETIC ANALYSIS OF A STRANDED RISSO'S DOLPHIN FROM THE TURKISH NORTH AEGEAN COAST OF THE EASTERN MEDITERRANEAN

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## Abstract

A Risso's dolphin was found stranded on the North Aegean coast of Turkey. A genetic study was performed on the stranded dolphin to understand the genetic structure of the individual. According to 16S mtDNA sequence analysis the stranded individual exactly matches with a Risso's dolphin from the Western Pacific and has only one base difference from another Western Pacific sample.

**Keywords:** Risso's Dolphin, Stranding, Turkish coast of North Aegean Sea, mtDNA

## Introduction

The Risso's dolphin (*Grampus griseus*) is one of the eight regular cetacean species of the Mediterranean (Notarbartolo Di Sciara, 2002) and the Mediterranean population of the species is assessed as Least Concern by IUCN Red List in 2008 (Taylor *et al.*, 2008). Although the species is native to Turkey, it is not frequently observed in Turkish seas like other small cetaceans.

On 26 April 2010, there was a live stranding of a 3.34 meters male Risso's dolphin on the coast of Kocaçeşme in the Gulf of Saros (North Aegean Sea). Despite all the efforts to turn it back to open sea the individual stayed in shallow water for two days and died. Tissue and teeth samples, as well as stomach content were collected for further analysis. Although a scar on the right side of animal's head could be the cause, the exact cause of death was not clear. Including this one, five strandings and two bycatch records of the species

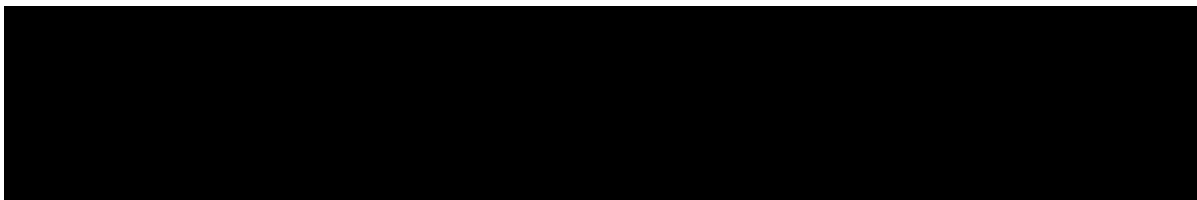
are known from the Mediterranean and Aegean coasts of Turkey since 1997 (Öztürk *et al.*, 2011).

## Materials and Methods

DNA was extracted from muscle tissue with the High Pure PCR Template Preparation Kit (Roche) following the manufacturer's protocol. Mitochondrial 16S rDNA sequence was amplified by PCR using 16Sar\_L and 16Sbr\_H primers (Palumbi *et al.*, 2002). The PCR product was checked on 2% agarose gel and was purified with the High Pure PCR Product Purification Kit (Roche) according to the manufacturer's protocol. The sequence analysis was done by Macrogen Inc. in Korea. The chromatogram was visualized by Chromas pro (Technelysium Pty Ltd) and manually checked. The 16S sequence was compared with two samples from South China, NC\_0120622, (Xiong *et al.*, 2009) and from Korea, AB481395, (Kim *et al.*, 2009). Multiple sequence alignment was run by ClustalW in Mega version 5 (Tamura *et al.*, 2011).

## Results

An alignment of 529 bp length of 16S was achieved. The sequences align with the complete mitochondrial genome NC\_0120622, from base position 1993 to 2521. Multiple sequence alignment shows that the North Aegean (Çanakkale) sample differs from the complete mitochondrial genome sequence by only one transition, while completely matching the AB481395 sequence (Figure 1).



**Figure 1. Numbered sites refer to the published complete mitochondrial genome sequence of *Grampus griseus* with GenBank accession number NC\_0120622.**

## Discussion

Although the Risso's dolphins seem to be rare in the Strait of Gibraltar and the degree of genetic flow remains uncertain between the Mediterranean and Atlantic, Gaspari (2007) found that UK and Mediterranean Risso's dolphins differentiated from each other in their Dloop sequences. In spite of the species' deep water preference, it has been observed in the Ionian Sea at a depth of 66 m and on one occasion at 7 m in Corinth Canal which it did not pass through (Frantzis, 2002). In our study the matched samples have quite a large geographical distance between them, with one sample from the Mediterranean Sea and other from the Western Pacific. One possible route for genetic flow could be through the Suez Canal but with a width of about 200 m and a depth of 21 m, it does not seem likely. Therefore the only other way to have a connection between the Mediterranean and Western Pacific is by crossing Africa via Cape Horn. To find an exactly matching 529 bp long 16S fragment across such a large geographical scale is interesting given that the species is considered as differentiated between two closer seas with a possible connection through Gibraltar. This study underlines the importance of considering more than one genetic marker for population genetic studies of the Risso's dolphin. Dloop and 16S results together would give more accurate results on the species differentiation between seas.

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