{rokbox title=|Sampled areas :: Image: Authors| thumb=|images/stories/ieo/imagenespublicaciones/centro-oceanografico-baleares-ieo-csic-phylogeography-veined-squid-loligo-forbesii-european-waters-gopel-et-al-2022-thumb.jpg|}images/stories/ieo/imagenespublicaciones/centro-oceanografico-baleares-ieo-csic-phylogeography-veined-squid-loligo-forbesii-european-waters-gopel-et-al-2022.jpg{/rokbox}

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, Hugo C. Vieira, Kai Wieland and Ralf Bastrop, 2022.
Phylogeography of the veined squid, *Loligo forbesii*, in European waters.
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Abstract: The veined squid, *Loligo forbesii* Steenstrup, 1856, occurs at the European Shelf areas including the Azores and represents a valuable resource for the European commercial fishery in the North East Atlantic. However, very little is known about its population structure and phylogeography. This lack of knowledge also impedes the development of sustainable fishery management for this species. The present study combined the use of two types of markers that retrieve patterns of gene flow in different time spans; the analysis of 16 nuclear microsatellites and sequencing of the mitochondrial cytochrome oxidase subunit I (COI). Whereas the high mutation rate of microsatellites allows the description of recent patterns of connectivity in species, the lower mutation rate of COI provides phylogeographic patterns on a longer timescale. A total of 347 individuals of *L. forbesii* were investigated from nearly the entire distribution range of the species, including the North East Atlantic Shelf, the Azores and the Mediterranean. Individuals from the Western and Eastern Mediterranean Sea have never been included in a genetic study before. We were able to analyse COI sequences from all 12 sampling areas and define three clades of *L. forbesii*. Due to our large sampling area, we are presenting 13 COI-haplotypes that were previously unknown. The microsatellite analysis does not include the Azores but three main clades could be identified at the remaining 11 sampling sites. Low FST values indicate gene flow over large geographical distances. However, the genetically significant differences and an additional slight grouping in the microsatellite structure reveal that geographical barriers seem to influence the population structure and reduce gene flow. Furthermore, both markers provide strong evidence that the observed phylogeographic pattern reflects the geographical history of the Azores and

the Mediterranean Sea.

Keywords: adaptive potential, COI barcode, conservation, fisheries, global change, over-fishing, resilience