

DNA BARCODING REVEALS A STRIKING NUMBER OF MÄERL SPECIES IN THE OSPAR AREA

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Maërl is a collective term for unattached calcified red seaweeds that, under favorable conditions, can form extensive beds. In the Oslo-Paris Convention (OSPAR) area, maërl beds have been reported from the Atlantic coasts off Norway to the south of Portugal; they are particularly abundant in Brittany (NW France) and Galicia (NW Spain). Maërl beds are considered habitats of ecological and economical importance because they harbor high biodiversity and benefit commercial fisheries. They should therefore benefit from conservation initiatives. However, maërl is sensitive to various stressors (commercial dredging, eutrophication, siltation, smothering by alien species and aquaculture) and there is consistent evidence of its decline in the OSPAR area. Furthermore, the taxonomy of maërl is fraught with uncertainties due to both phenotypic plasticity and convergence which lead to a lack of well-defined diagnostic characters. For instance, a background report on maërl beds issued by OSPAR in 2010 listed 10 maërl-forming species; however, it warned that species status and limits were often uncertain. In this context, DNA barcoding seemed to be a fruitful alternative; we have therefore undertaken a DNA barcoding study of maërl from OSPAR (Svalbard to Algarve) and adjacent (Macaronesia) areas. COI-5P was sequenced for 136 samples and further analyzed with the software ABGD. Our results highlighted the effectiveness of DNA barcodes as an identification tool for cryptic maërl-forming species. Fifteen Operational Taxonomic Units (OTUs) were detected but only 4 could be assigned to known species: *Phymatoliton calcareum*, *Lithothamnion corallioides*, *Lithothamnion glaciale*, and *Mesophyllum sphaericum*. Seven OTUs concentrated most of the samples (major OTUs); the other 8 were scarce and occurred in only one or a few locations. Major OTUs displayed a latitudinal gradient and some species (*P. calcareum*, *L. corallioides*) might be less widespread than previously thought. Only 3 OTUs matched BINs in BOLD, indicating that there is still much work to be done in the barcoding of maërl-forming Corallinales.

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