



## **Genetic diversity study of broad range sponge taxa for new insights into the connectivity of cold-water coral reefs along the European margins.**

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Deep-water coral banks and patches (most commonly built by *Lophelia pertusa* and *Madrepora oculata*), occur all along the European shelf margin, a few patches in the Mediterranean Sea and more extensive from Gibraltar up to Norway. They act as nurseries for fishes and harbor a multitude of invertebrates - some new to science and potential coral reefs endemics- making them Hotspots of Biodiversity. However, with the depletion of shallow-water fish stocks and the increasing commercial exploitation of the deep-sea environment, there is actually a high concern in Europe to better understand these ecosystems in order to achieve a sustainable management of these complex but fragile ecosystems. Sponges, which appear to dominate these aphotic ecosystems, were subjected to robust assessment of species distributional ranges. Preliminary comparison of datasets on bathyal (>200m) sponge biodiversity surveys highlighted several broadly ranged sponge species associated with different deep-sea coral reef populations along the European margin. In particular, a limited series of generalized habitus (thin/hairy, thin/soft, hollow/bladder, massive/soft, megabenthic/siliceous) were reported. The five broad ranged taxa; *Hexadella* sp, *Desmacella* sp, *Mycale* sp, *Plocamionida* sp, *Pheronema* sp were selected as model species for these generalized habits, which may highlight a different role in the development and erosion of cold-water coral reef ecosystems. Studies of the molecular phylogeny and the intra-specific (genetic) diversity are being performed on these taxa with the pur-

pose of detecting population structure and phylogeography. Such studies represent state-of-the-art, highly powerful tools for increasing insights into the connectivity of deep-sea reefs along the European margins. Data about the genetic structure of these species in several localities have a direct application for management; if gene exchange exists between populations then the loss of areas of reef will be less damaging to the overall genetic diversity of the species.