COLD-WATER CORAL ECOSYSTEMS IN THE PENMARC'H AND GUILVINEC CANYONS (BAY OF BISCAY): DEEP-WATER *VERSUS* SHALLOW WATER SETTINGS

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In 1948, Le Danois reported for the first time the occurrence of "massifs coralliens" along the European Atlantic continental margin. Within the framework of the EC FP6 IP HERMES and ESF EuroDIVERSITY MiCROSYSTEMS projects, the R/V Belgica BiSCOSYSTEMS cruise was set out to rediscover these cold-water corals in the Penmarc'h and Guilvinec canyons along the Gascogne margin of the Bay of Biscay. During this cruise, an area of 560km^2 was studied using swath bathymetry (EM1002), high-resolution reflection seismic profiling, CTD casts, ROV observations and USBL-guided boxcoring.

Based on the multibeam data and the ROV video images, two different cold-water coral reef settings were distinguished. In water depths ranging from 260 to 350m, mini-mounds up to 5m high, covered by dead cold-water coral rubble, were observed. In between these mounds, an alternation of rippled and unrippled seabed with a patchy distribution of dropstones was observed. The second setting features both living and dead cold-water corals (predominantly *Madrepora oculata*) in water depths of 700 to 950m. At certain locations, they form dense coral fields with a diameter of about 10-60m, characterized by mostly dead coral graveyards and a few living ones. In this area also hard substrate with cracks, ridges, cliffs and oyster banks was noticed.

Both the shallow area with the mini mounds (SE flank of the Guilvinec canyon) and the living and dead corals in the deeper setting were sampled with boxcores. These boxcores were used to determine the different sedimentary facies and to identify coral species present on the site. For this purpose, grain size analysis and U/Th dating of coral fragments were established.

The cold-water corals from the deeper area occur in a density envelope (sigma-theta) of 27.35-27.55kg.m^{-3}, falling within the range of values which are considered to be a prerequisite for the development, growth and distribution of cold-water coral reefs along the northern Atlantic margin (Dullo *et al.*, 2008). The presented data prove for the very first time that this prerequisite is also valid for the Bay of Biscay. However, this does not explain the presence of the shallow mini mounds, for which another genetic model needs to be proposed.

References

Le Danois E. 1983. Les profondeurs de la mer. Trente ans de recherche sur la faune sous-marine au large des côtes de France. Payot, Paris, 330p.

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