

The composition of cold-seep macrofaunal communities associated to symbiont-bearing megafaunal taxa from the giant pockmark Regab in the deep Gulf of Guinea (3160m) was examined in this study. The main issues of this study were (i) to determine to what extent habitats, defined by symbiont-bearing taxa, influence the structure of the underlying macrofaunal communities, with a focus on polychaetes (inter-site comparison) and (ii) to determine if temporal variations of the macrobenthic communities associated with these sites may occur over time (intra-site comparison) and understand the reasons. Discovered in 2001, cold-seep communities associated with Regab offer a great opportunity to enlarge our knowledge on the functioning of such unfamiliar ecosystems. Submitted to high concentrations of methane and hydrogen sulphide, both very toxic to organisms, communities of megafauna, represented by three taxa, Vesicomidae, Mytilidae, Siboglinidae have developed adaptations to be able to cope with such hostile conditions (e.g. symbiosis with chemoautotrophic bacteria). Their repartition provides a mosaic of different habitats distributed along a gradient of methane fluid flow. Communities of macrofauna (>250µm) associated with these habitats exhibited different structures and compositions, depending on the habitat, suggesting a close link with the type of habitat (Vesicomidae, Mytilidae or bacterial mat). Also, an important change in the macrofaunal community of a vesicomid aggregate located in the more active central part of Regab occurred between 2008 and 2011. It raised the question on the extent to which symbiont-bearing species influence the underlying infauna and to which environmental factors (methane fluid flow, concentration of methane and hydrogen sulphide) prevail on the action of ecosystem engineers to influence communities of macrofauna.