

Abstract

The goal of this work was to summarize the present knowledge about olfaction in deep-sea fishes. The research on this topic is seldom, however, few interesting studies suggest the importance of olfaction in these inhospitable conditions. After a short introduction of how the olfaction works, individual description of deep-sea adaptations follows. Implications on the importance of a specific sense can be made based on comparisons between individual brain areas responsible for the input of each sense. The importance of individual senses was investigated in mesopelagic and demersal species. Ontogenetic shift in sensory importance is one of the adaptations. Furthermore, sexual dimorphism in the olfactory system. Enlarged olfactory organs in males are most likely responsible for easier localisation of a female. Regarding the olfactory receptor repertoire, a whole genome of a hadal fish from the Mariana trench marked a massive loss of olfactory genes but highlighted their specificity. My own data included in this thesis estimate the number of the olfactory genes in deep-sea fishes for which we lack the high-quality genome. The estimates (albeit with large confidence intervals) suggest rather smaller numbers of genes in most of the species, while there are some species with putatively expanded gene number, which I identify hereby as candidates for the future genome research as verification.