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HOW TO SURVIVE AND PERSIST IN EPHEMERAL WATER BODIES? THE CASE OF SPONGES (PORIFERA: SPONGILLINA)*

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Ephemeral water bodies are subjected to unforeseeable and extreme fluctuations of environmental conditions constraining biodiversity values. Although data are fragmentary and scattered in the literature sponges are known to be able to colonize temporary/intermittent water bodies. Records at the global level refer to a wide range of climates from arid (e.g. African deserts) to temperate (e.g. Mediterranean islands), and cold (e.g. Nearctic permafrost) areas. Sponges face environmental constraints displaying chronic morphogenesis, clonality, modularity, and cryptobiosis by dormancy of resting bodies (gemmules) allowing both dispersal and short- to long-term persistence. Gemmules are small spherules (0.25 to over 1 mm in diameter) containing totipotent cells protected by a siliceous/proteic theca. Adaptive strategies of freshwater sponges are based on a high plasticity of body bauplan, physiology, life cycle, and reproductive behaviour. The life cycle rhythm is characterized by the alternation of vegetative (active sponges) and cryptobiotic phases (gemmules). A metamorphic process occurs by loss of the mother sponge functional body (total/partial degeneration) and production of gemmules (channeling of biomass/energy into staminal cells). Hibernation or aestivation occurs cyclically according with the climatic regime. During both long- or short-term dormancy sponges are represented only by gemmules adhering to hard substrata, floating at the water surface, or resting on the silty/sandy bottoms. Chronic morphogenesis from gemmules supports the regeneration of the mother sponge. Clonal gemmules enhance colonization and survival potentialities by performing a double functional role as resistant bodies to persist *in situ* and as propagules by passive dispersal (e.g. by wind or animal carriers).

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