Innovative biotechnological filter based on aquatic moss to be applied in aquaculture

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Fish farming pollutes waters with high concentrations of nitrogenous compounds and therefore the use of plants for phytofiltration is one of the promising trends in environmental biotechnology to purify wastewater. Aquatic moss biomasses, due to the ability of the gametophyte to absorb pollutants through the whole of its surface, can act as live filtering material, furthermore they represent a possible 3D support for the classic nitrifying bacteria. In this study, in the frame of the project fish RISE (PON 2014/20 ARS01_01053), it was tested the variation of the amount of nitrogenous compounds such as nitrites, ammonium ions and urea by two species of moss, *Taxiphyllum barbieri* and *Leptodictyum riparium*, both in sterile and non-sterile conditions. These are able to metabolise nitrogenous compounds. Indeed, from the results obtained it is possible to confirm this ability, because the concentration of nitrogenous compounds decreases in time. The use of Nitrogen compounds related to different metabolic steps allow to discuss in more detail the action of the two compared species. The nature of pollutants was selected having in mind the needs of aquaponic biofiltration, but the applicability is wide. However, it is evident that aquatic mosses, thanks to numerous advantages, can be the basic component of biofilters for aquaponics, representing a new opportunity for the eco-sustainable recovery of water.