EXCITATION/EMISSION SPECTRAL SCAN USE TO STUDY TESTATE AMOEBAE WITH SYMBIOTIC ALGAE

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Testate Amoebae (TA) (Arcellinida and Euglyphida) are a single-cell amoeboïd organisms surrounded by shell of the size of 10-400 um. They inhabit freshwater, rarely brackish environment. The main reason for increased interest in TA stems from their cosmopolitan dispersion, high abundance, excellent preservation in the Quaternary sediments and species specific ecological preferences such as eutrophication. TA represent a good candidate as a model organism for studies in ecology and ecotoxicology. Interestingly, some TA species contain endosymbiotic algae. These may also respond to changes in the environment indirectly through the amoeba itself or directly if some contaminant enters the amoeba cell without affecting it directly. Number of algal cells and their individual volumes can bring the interesting results [1].

Optical microscopy techniques nowadays offer high resolution and real-time cell/intracellular organelles imaging facilities. A new tunable laser source – the White Light Laser – was recently introduced as an ideal excitation source for confocal laser scanning microscopy [2]. White Light Laser is a picosecond pulse source with full tunability in the spectral range 470-670 nm. This full tunability in 1 nm increments is achieved by the combination of AOTF (Acousto-Optical Tunable Filter) and tunable beam splitter AOBM (Acousto-Optical Beam Modulator), so that it is possible to pick any excitation wavelength from the continuous 470-670 nm spectrum, and the same wavelength is blocked by the AOBM from reaching the detector. The full fluorescence spectra can then be detected by spectral detector based on moveable spectral sliders with 1 nm resolution.

Our application of this full excitation/emission spectral scan is focused on resolving (auto-)fluorescence from symbiotic/digested algae inside the testate amoebae (Hyalosphenia papilio) to find out optimum excitation laser wavelength and optimum spectral detection range. This feature will improve possibilities to resolve different development stage of TA. The goal of this study is exploring the possibilities and use of excitation/emission spectral scans to expand the scope of environmental studies.

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