

Aquaphotomics for investigating water functionality

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Every water is different, numerous natural (spring) waters and ‘treated’ waters are on the market with promoted health benefits. There is a need to inform consumers and to support ‘treated water’ producers, by providing independent measurements and feedback on the functionality of water. In this work, the effects of one type of water treatment device (Efibia/ ESENÇA) has been investigated extensively, both by observing its effects in agriculture as well as physical tests. An Aquaphotomics protocol was designed to investigate water functionality in 1300-1600nm range. Water handling, choice of perturbations and measurement set up are important to bring forth water properties and obtain reproducible results. In all experiments, aquagrams of Efibia were different at 1364 nm compared to Control. It was shown that Efibia water properties are reproducible over time (at least 9 months old water) and for different tapping dates. Although water absorption spectrum is complex in NIR range due to the overlapping nature of vibrational overtone and combination bands of water molecular structures, certain ranges of wavelengths (so called bands) have been related to molecular structure and functionality. 1364nm falls in the 1360-1366nm range that has been assigned to the ‘water solvation shell’, giving a good indication that Efibia water has a different functional effect related to better solving compounds, therefore more reactive. This supported the hypothesis of the producers of the ‘treatment water’. This work shows the potential of Aquaphotomics for investigating water functionality and aims to inspire other researchers to collaborate and investigate further.