MONITORING OF THE DEVELOPMENT OF SOMATIC AND CALLUS RICE CELLS USING AQUAPHOTOMICS

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INTRODUCTION

Water is one of the most important component of the biological systems¹. It is essential to discover the relationship between the different water

MATERIALS AND METHODS

Materials

Somatic rice and callus rice cells were monitored.

molecular structures in living systems and its functionality. Non-invasive dynamic analysis method has to be used to monitor the biological and aqueous systems².

OBJECTIVE

The objective was to monitor the development of somatic and callus rice cells by Aquaphotomics approach in order to identify different developmental stages.

Rice seeds (Oryza sativa) were grown in petri dishes. Plant growth regulator hormone was supplemented to initiate callus cells. From the 4th to the 26th day of preparation 28 somatic and 28 callus rice seeds were monitored.

Instrumentation

SAIKA instrument (SAIKA Technological Institute Foundation) with fiber optic cable was used. Transmittance spectra of the individual seeds were taken in the range of 660-960nm. Every seeds were measured at four different position using 5 consecutive scans (n=13440).

Data evaluation

Data evaluation was performed on **absorbance** (logT⁻¹) values in the range of **720-955nm**. Various spectral preprocessing (e.g. smoothing, SNV, averaging and 2nd derivation) and chemometrics methods (e.g. PCA, PCR, HCA, LDA) were applied.

Somatic rice cells



RESULTS AND DISCUSSION

the water molecular system changes during cell development.