

Laser-Induced Fluorescence Spectroscopy for Rare Earth Elements Detection in Plants

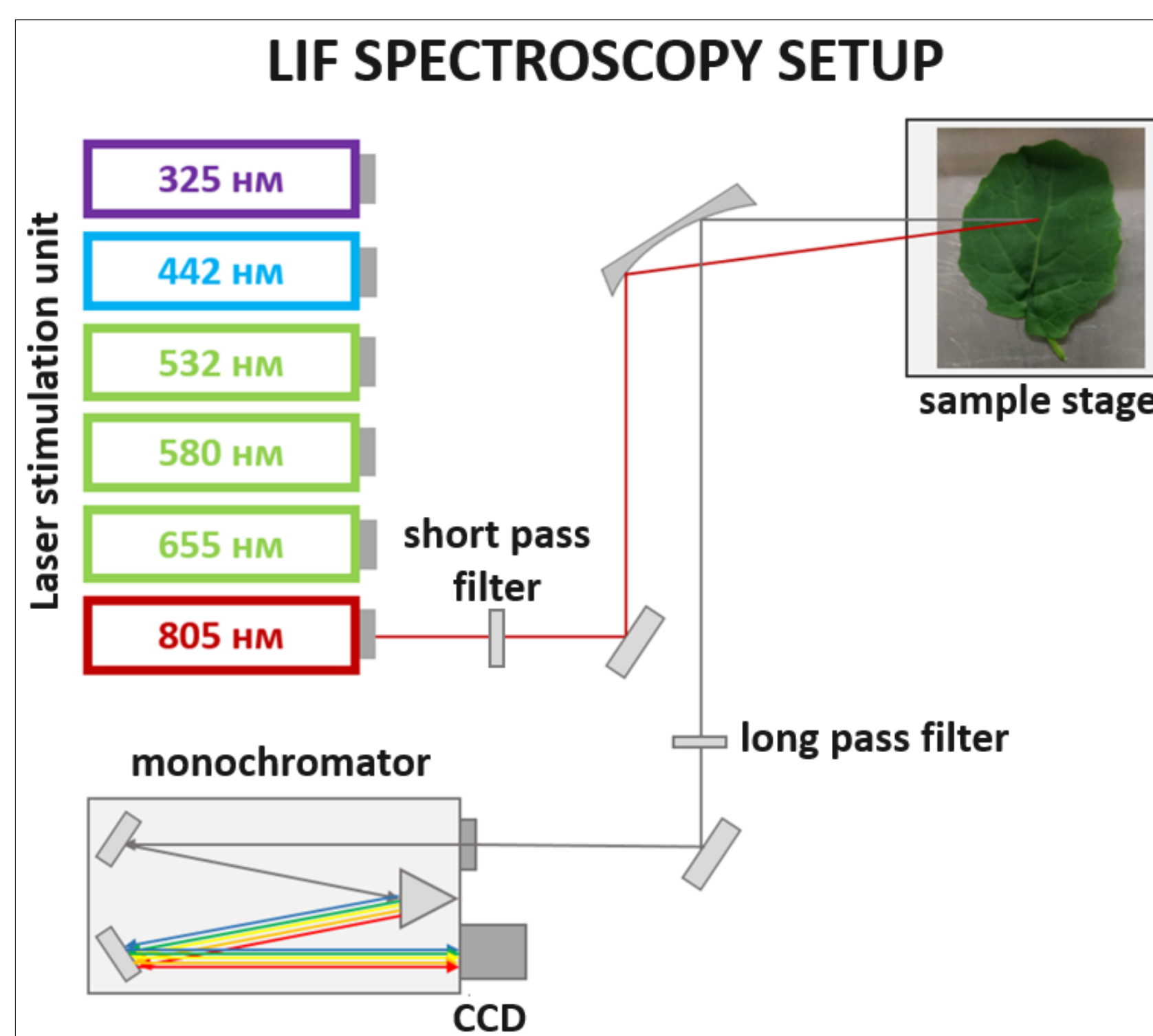
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▪ **THE OBJECTIVE** of this experiment was to detect the spectral features of Nd^{3+} and Er^{3+} in *Brassica napus* and *Zea mays*.

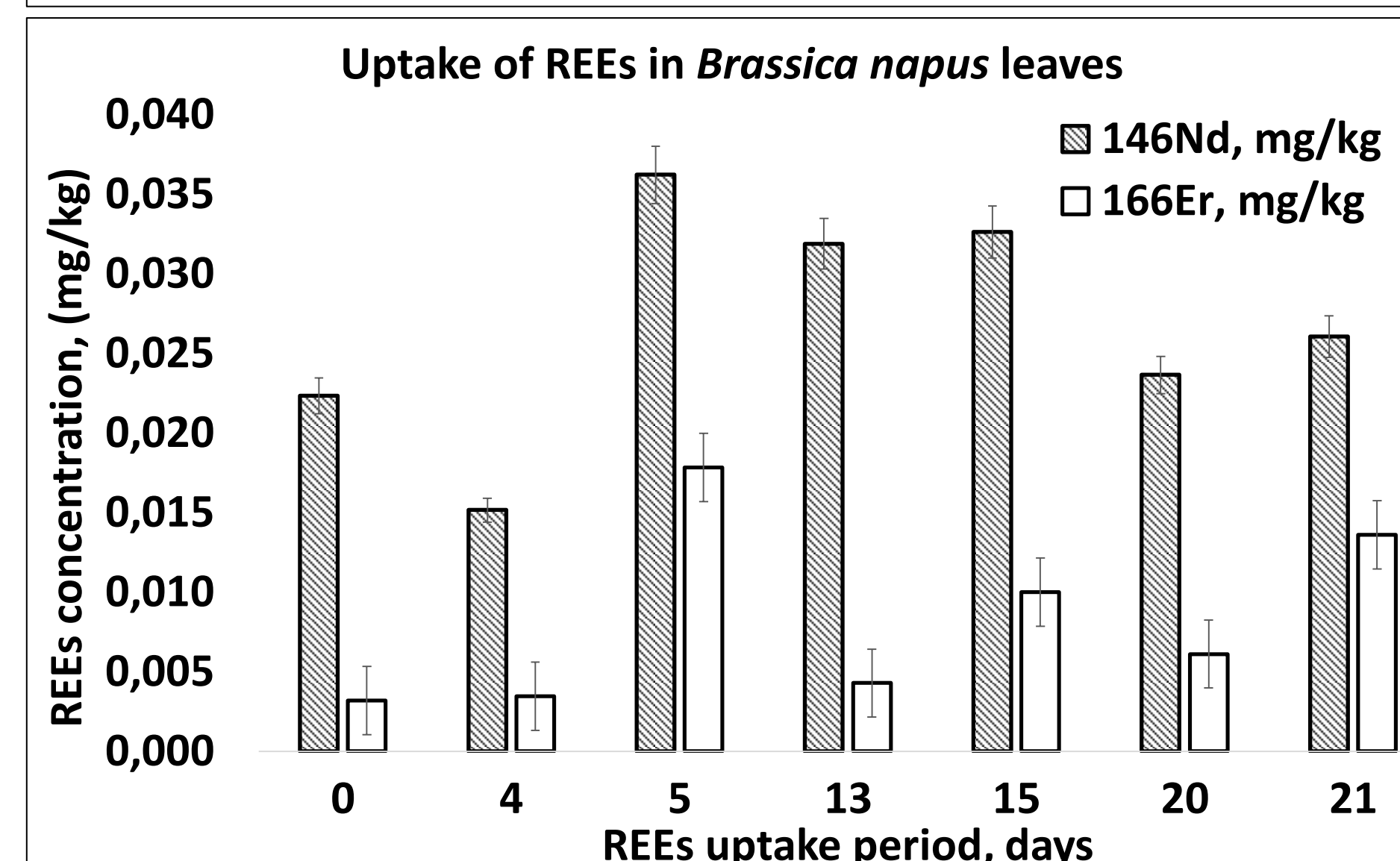
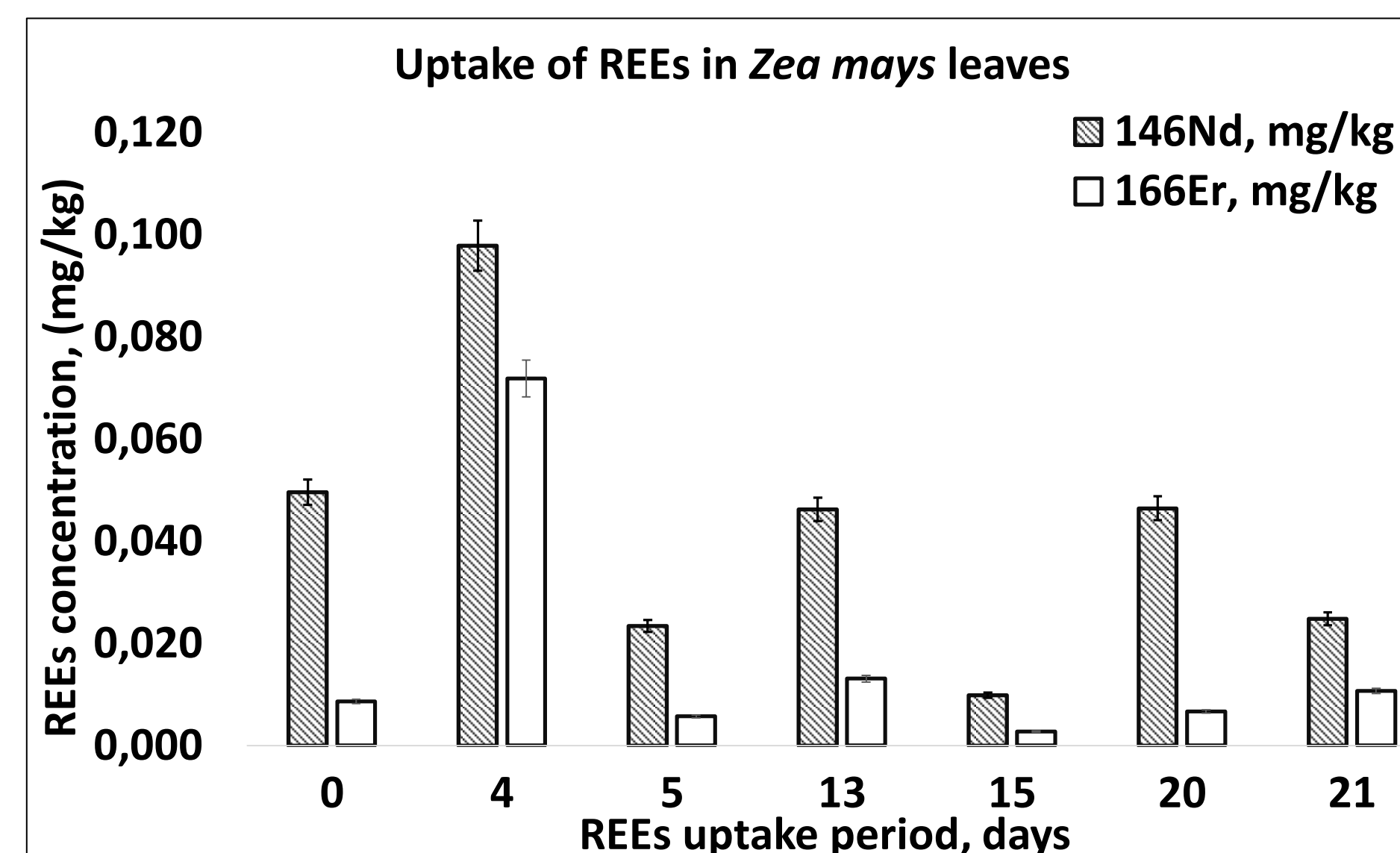
▪ **METHODS:**

- Laser Induced Fluorescence (LIF):
 - Nd:YAG Green laser ($\lambda_{\text{ex}} = 532 \text{ nm}$)
 - NKT supercontinuum white light laser ($\lambda_{\text{ex}} = 580, 605, 805 \text{ nm}$);
- Inductively coupled plasma mass spectrometry (ICP-MS)

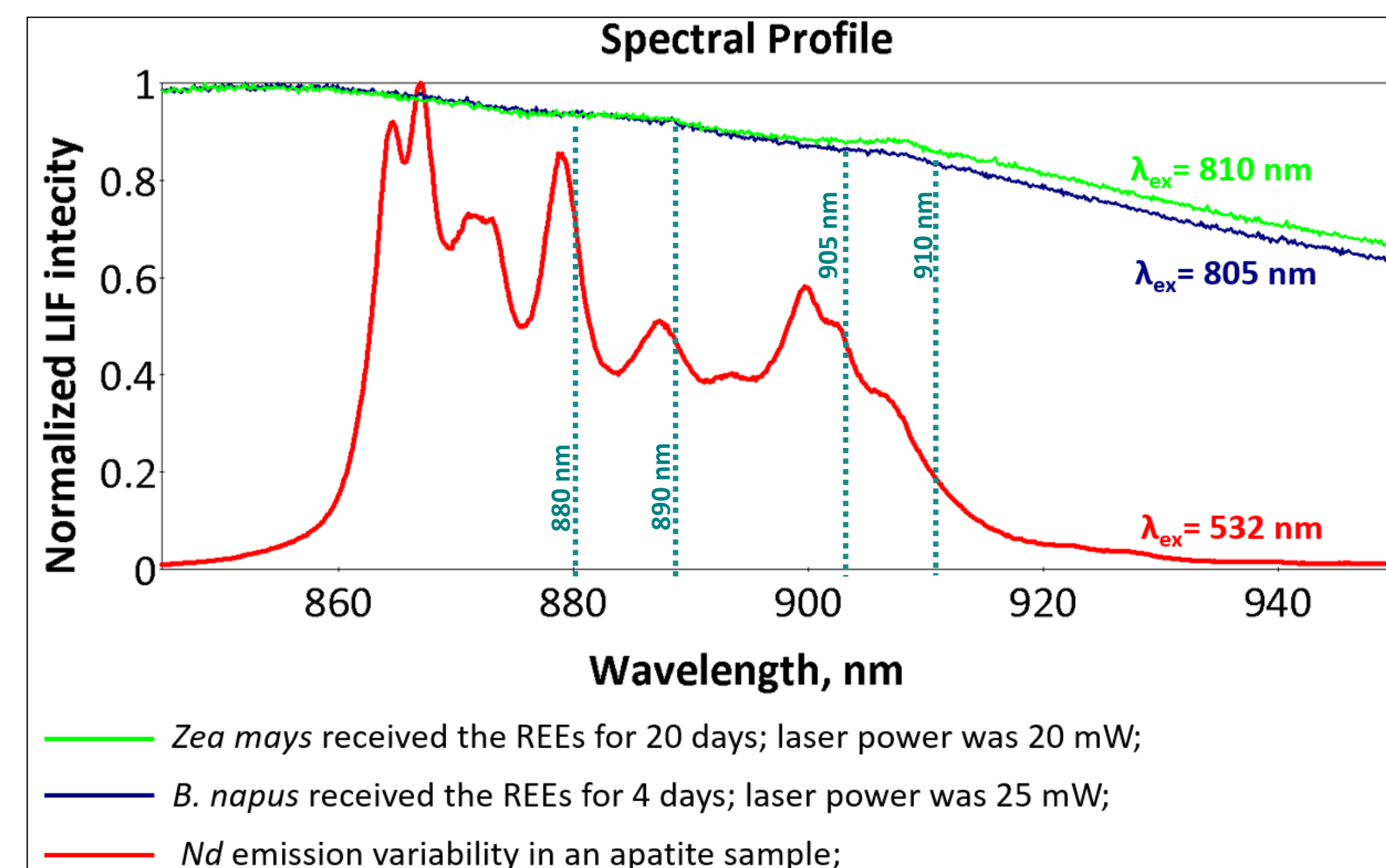


▪ **RESULTS**

- Concentration of *Nd* and *Er* among species



• **Emission Matrices Comparison**



▪ **CONCLUSION**

- REEs were added to the solution in form of nitrates. Before watering, 10 mmol/l REEs (Nd^{3+} and Er^{3+}) solution was diluted in portion 1 to 1000. The concentration was increased after after 15 and 18 days up to 50 mmol/l and 100 mmol/l, respectively.
- Potential characteristic spectral features for *Nd* were detected in two ranges: 880-890 and 905-910 nm. Excitation wavelength of white laser were 20 mW and 25 mW for *Z. Mays* and *B. napus*, respectively.