

Phytotoxicity Effect of Olive Mill Wastewater (OMWW) on Cress Germination

Sebastian Romuli¹, Jonatan Wunsch¹, Andrés Hernández-Pridybailo², Joachim Müller¹

¹University of Hohenheim, Institute of Agricultural Engineering, Tropics and Subtropics Group (440e), Germany

²University of Hohenheim, Institute of Crop Science, Nutritional Crop Physiology (340h), Germany

Problem and Objective

- Morocco is one of the biggest olive oil producers globally, generating considerable amounts of olive mill wastewater (OMWW), also known as margine.
- Despite the environmental risk, margine application as a biofertilizer and biopesticide is still being investigated.
- The objective of this study is to assess the phytotoxic effect of margine on plant germination.

Material and Methods

- The margine was provided by OLEAFOOD in the Fès-Meknès region.
- Germination test according to DIN EN 16086-2 using cress (*Lepidium sativum*).
- Three different margine application rates on perlite, namely 0 t/ha (P00, control), 20 t/ha (P05), 40 t/ha (P10), and 60 t/ha (P15).
- The seedling growth parameters were determined by SmartRoot plugin from ImageJ software.

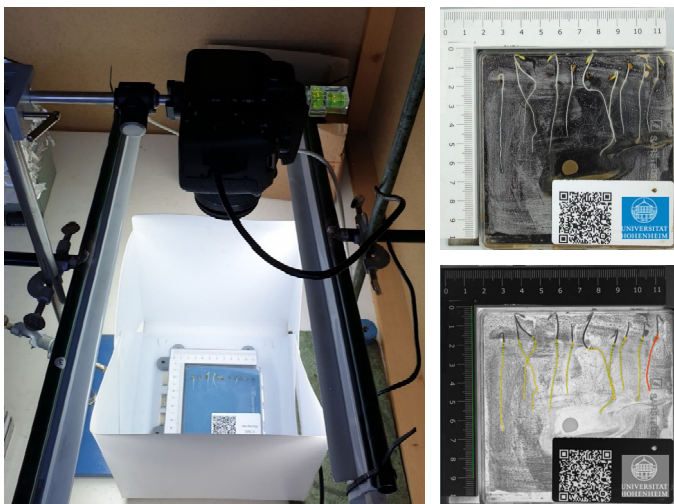


Fig 1. Photo setup (left), actual image (top right), and processed 8-bit greyscale picture (bottom right).

Results

- A significant change of root and shoot length was detected at $p < 0.05$.

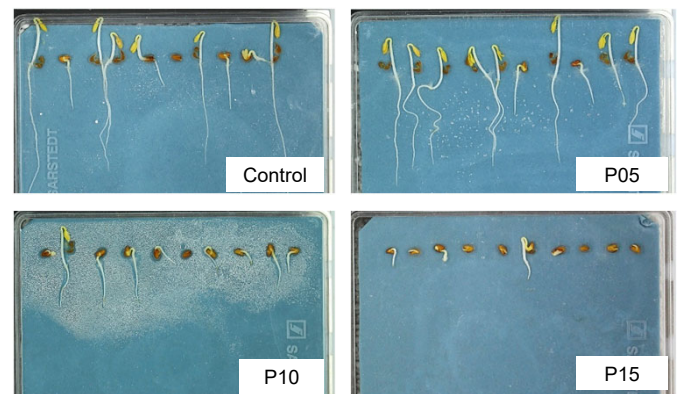


Fig 2. Visualization of cress germination under different margine application rates after 72 h.

- The overall results also showed lower biomass and dry weight of cress for higher margine concentration.

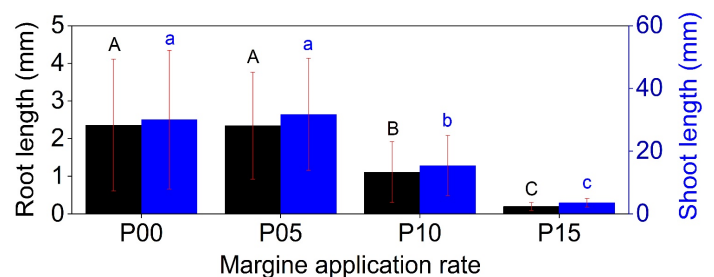


Fig 3. Root length of cress under different margine application rates after 72 h. Means with same upper and lower case letters indicate no significant difference among root and shoot length at $p < 0.05$, respectively.

Conclusions

- The phytotoxicity effect of margine on cress seeds was shown in the depression of root and shoot length elongation.
- Further research should focus on the phenolic compounds.