



Hydrophobization potential of organic compounds deriving from olive oil production waste water

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Olive oil production waste water (OPWW) is rich in dissolved organic carbon and nutrients (e.g. potassium). In order to use it as organic fertilizer, small-scale and family run olive oil production farms in Israel and Palestine often discharge it directly onto agricultural land without any previous treatment. One unwanted side effect that can be observed is the development of soil water repellency (SWR) which is probably induced by amphiphilic substances. Previous studies on the composition of OPWW have shown that it contains oil components such as phenols, fats and large-molecular organic compounds (e.g. Gonzalezvila et al., 1995), some of which have been reported to induce water repellency on soil mineral surfaces (e.g. Ma'shum et al., 1988; Leelamanie and Karube, 2007).

For prioritization of compounds the individual hydrophobization potential of 16 common OPWW components was systematically evaluated using the sessile drop and the Wilhelmy plate method. Acid-washed sand was taken as model soil mineral material.

In a batch experiment OPWW samples from Israel and Palestine were applied to sand and two different soils in order to investigate their hydrophobization potential under different temperature and humidity conditions.

To facilitate the identification of the chemicals responsible for inducing SWR, a fractionation procedure was applied to fraction the OPWW samples using solvents of different polarity. The prioritized compounds were analyzed by GC-MS. First results of this identification will be presented as well.