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Study of heavy metal bioavailability in a soil contaminated by Ni+2 after application of biochar prepared from olive mill pomace

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Olive trees are one of the major crops in countries with a Mediterranean type of climate. More than the 30% of olive trees in the world are located in Spain [1], approximately 2423841 ha. The main area is Andalusia, region of southern Spain, with more than 1480162 ha. Indeed, the oil extraction industry is an important activity in Spain, and during the two stage olive oil extraction process is produced a waste called olive mill pomace (OMP). Only in Andalusia, between 2.5 and 4.0 million tonnes of OMP are produced annually [2]. Traditionally, OMP has been used as organic amendment [3] and more recently, for the production of activated carbon for water treatment [4]. An alternative way of valorization could be the preparation of biochar from OMP and its use as amendment in soils contaminated by heavy metals to reduce plant heavy metal availability. The main objective of this work is to study the influence of two biochars prepared from OMP at two different temperatures (300ºC, 500ºC) in the plant-available metal in a contaminated soil by Ni+2. Plant-available metal were extracted from soil with diethylenetriaminepentaacetic acid-CaCl2-triethanolamine (DTPA) and the mobile forms of heavy metals were extracted using 0.1 M CaCl2. The study was completed studying the influence of the biochar application in several enzymatic activities (dehydrogenase, b-glucosidase, phosphomoesterase and arylsulphatase).

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