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Scientists Use Olive Industry Waste

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The waste obtained from olive during the oil extraction process can be used to eliminate heavy metals from sewage or waste waters of productive activities. Olive pits, pomace and remains (from olive tree pruning) present an outstanding capacity to retain the lead present in this water, which confirms their capacity as biosorbents for their application in the depuration of effluents on an industrial scale.

This is one of the main conclusions of the doctoral thesis "Characterization and application of residual biomass for the elimination of heavy metals" carried out by M^a Ángeles Martín Lara in the department of Chemical Engineering of the University of Granada, which has been supervised by professors Francisco Hernáinz Bermúdez de Castro, Gabriel Blázquez García and Mónica Calero de Hoces.

Given the high la toxicity of heavy metals in solution on the ecosystem, one of the main problems of this industry at present is that there are not many metabolisation routes by the living beings or of degradation by the environment, and some of them have a limited capacity . This recalcitrance, together with an excessive deposit to the environment, usually of anthropogenic origin, generates serious environmental problems that sometimes are difficult to control.

A “clean” alternative
Biotechnological processes have attracted the attention of the scientific community due to the variety of detoxification methods of heavy metals. Among them, according to the UGR researchers, “biosortion represents a viable alternative technical and economically, both for its depuration capacity and its economic operation cost, it has also been considered as a “clean” technology in the elimination of heavy metals in sewage and waste waters of productive activities”.

The UGR scientists have studied the capacity of these three solid residues obtained from olive oil industry (olive pits, pomace and pruning remains) to depurate effluents with lead in dissolution, both in mono-metallic systems (lead only) and in bi-metallic systems (lead and chromo).

Olive industry produces great amounts of such sub-products in Andalusia and their costs are very low or even null; sometimes, their management can become a problem. Their use as biosorbents of heavy metals, according to the researchers of the UGR, “makes them a very desirable alternative, as they would have an extra value before their final elimination”.

Lead retention takes place in a very fast way with the three biosorbents used. The process becomes faster when using pruning remains; similar results have been obtained when using pits and pomace.

The work carried out at the UGR has also revealed that the three biosorbents analyzed present a higher affinity for lead than for chromo as the lead biosortion capacity is significantly higher. When two heavy metals are present in an environment, the capacity of biosortion is lower, which could be connected, according to the researchers, with the interferences produced between both ions in the points of sortion.

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