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Mid term monitoring of heavy metals content in soils of Mediterranean coastal wetlands. La Albufera de Valencia Natural Park, Spain

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Coastal wetlands, in general, and Mediterranean ones, in particular, suffer from differente anthropogenic pressures that may affect their intrinsic environmental and ecological functions. Most, if not all, Mediterranean wetlands are not natural spaces were preservation of habitat and wildlife is the only management policy achieved, bur rather their terriroty is a combination of land units with different activities and influences, such as farming, environmental protection and connectivities with urban and industrial areas. Therefore, the need of periodical monitoring is required whenever pressures and environmental health of wetlands is assessed, particularly of those processes that affect the interconnection of environmental compartiments involving water, soils and biota. In agro-ecological protected wetlands soils play and important role because they are potential sources of pollutants due to farming practices. In this case, presence of heavy metals in soils is and indicator of both environmental health and anthtopogenic direct (farming activities) and indirect (neighbour urban areas) pressures.
In this work a mid term (17 year) monitoring of seven heavy metals (Cd, Co, Cr, Cu, Pb, Ni and Zn) in soils of coastal Mediterranean wetlands (La Albufera Natural Park, Spain) are analyzed. Two monitoring campaings were achieved in 1991 and 2008. In both cases the same 20 points were visited which were distributed in the natural park according two four different sectors of potential anthropogenic pressure and land use. At each point two soil samples were collected at differente depths (0 to 20 cm and 20 to 40 cm). The selected metals were analyzed to determine its total and extractable fractions by treatment with EDTA. Atomic Absorption Spectrometry, using graphite furnace when necessary, was used for the determination of metals.
In general, there is a reduction of metal contents in the study area in both dates. The trend of metals according to average concentration (mg/kg) in 1991 and 2008 were Zn (60.38) > Pb (47.50) > Ni (29.10) > Cu (25.82) > Cr (16.04) > Co (11.40) > Cd (0.50) and Zn (68.82) > Cr (48.12) > Cu (34.93) > Pb (24.60) > Ni (22.49) > Co (6.58) > Cd (0.42), respectively. Average increments were found in Zn, Cr and Cu, which are related with high point (indiviudal location and/or sector) values rather than a general trend in the area. Maximum concentrations were obtained for Zn (120.38 mg/kg and 230.05 mg/kg in 1991 and 2008 respectively), Pb (72.31 mg/kg and 64.90 mg/kg), Ni (43.07. mg/kg and 43.74 mg/kg), Cu (55.83 mg/kg and 109.91 mg/kg) and Cr (36.10 mg/kg and 254.93 mg/kg).
There is a clear spatial trend in the distribution of heavy metals in both dates, higher values where found in the northern sector of the Natural Park, which is a neighbour sector of the large city of Valencia, and in points close (less than 500 m) to main roads, suggestin the influence of external factors in the distribution of pollutants.

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