

Large spill of mining wastes in Portelo stream: Impact on water quality and on macroinvertebrate assemblage

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Continuous effects of mining activity on water quality and aquatic biota have been documented in a wide range of aquatic systems. Conversely literature concerning the consequences of the releasing of large millions of cubic meters of waste products of ore-processing facilities in streams is scarcer. These sudden accidents may intensify water pollution and have strong impacts in biota. Portugal has about 175 old abandoned mine sites. Some of which are seriously degraded, contaminated and large volumes of old mining residues have significant environmental impact on local or regional scale. Portelo stream is located in the surroundings of an abandoned Sn mine in Montesinho Natural Park (NE Portugal).

The drainage of fine grained tailings can be particularly problematic due to arsenic, copper, aluminium and zinc. However, until now no significant disturbance was detected in water quality and in biota. There has never been such a large spill of mining wastes as that occurred in January 2010. As a consequence of intense precipitation, several millions of cubic meters of wastes were spilled into Portelo

stream. The large amount of wastes covered the riverbed with a layer of mud reaching more than half a meter in areas close to the mine. Both riparian and agricultural areas were also affected by the sediments from mine. Wastes were spilled downstream by several strong rain events. The objective of the present research was to evaluate the evolution of the water quality and macro-invertebrate assemblages during the first semester after the spill. To achieve the proposed objective the water from four sampling points along the affected stream was sampled for the following metals - Al, Mn, Co, Cu, Ni, Cd and As. Concomitantly, macroinvertebrate assemblages were also assessed. Temporal differences between stations were not detected. On contrary spatial differences were found. As expected, the stations located near the mine showed the highest levels of contamination. Consequently, in these stations no macroinvertebrates were found during the period of study.

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