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Assessment of streambed sediment contamination by heavy metals: The case of the Gabes Catchment, South-eastern Tunisia

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1 **Assessment of streambed sediment contamination by heavy metals: The Case of the**
2 **Gabes Catchment, South-eastern Tunisia**

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5 **Abstract**

6 This study deals with the assessment of the behaviour of seven heavy metals (Cd, Zn,
7 Cu, Pb, Ni, Cr and As) in streambed sediments within the Gabes Catchment, located in
8 South-eastern Tunisia. To understand the effect of intense human activities in the Gabes
9 Basin on the quality of the environment, 22 sediment samples, spread all over the study
10 basin, were taken and analysed for heavy metals. Heavy metal concentrations were shown to
11 vary in the following order: Zn>Pb>Cu>Cr>Ni>Cd>As. Sediment quality was assessed
12 based on the evaluation of various indices. A total of 27 % of the sampling stations are
13 characterised by sediment Enrichment Factors (EF) exceeding 40, reflecting extremely
14 severe pollution. This result was also confirmed by different indices, including Sediment
15 Pollution Index (SPI), Pollution Load Index (PLI) and Geo-accumulation index. The
16 calculation of Mean Effect Range-Median Quotient (M-ERM-Q) indicated that in stream
17 discharge, all metals have a probability of 21 % to be toxic. The ecological toxicity risk of
18 heavy metals increases close to urban (traffic activity) and industrial activities (industrial
19 complex of Gabes). Close to Gabes City, the situation and the degree of contamination that
20 may be transferred into marine ecosystems is worrisome and requires immediate
21 intervention.

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