

Mercury and Artisanal and Small-scale Gold Mining in the Guianas: Insights from aquatic and terrestrial environments

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Legal and illegal Artisanal and Small-scale Gold Mining (ASGM) is a widespread activity highly developed in Southern countries. This activity uses rudimentary techniques to prospect, extract and process ores¹, induces deforestation, destruction of habitats, release of mining waste, cyanidation of tailings and amalgamation with mercury (Hg)^{1,2,3}. ASGM accounts for 15 to 25% of the gold production worldwide³ and 37% of the global Hg pollution³. Mercury also poses substantial health effects to miners and communities living in ASGM areas^{1,3} which makes important to understand the cycle of mercury in the environment. In this study, we propose to assess the impact of ASGM in both aquatic and terrestrial environments along the Guianas plateau, in Guyana, Suriname and French Guiana². Five areas were studied: four river systems (Potaro, Mazaruni and Siparuni in Guyana, Suriname in Suriname) and one inland area (Cacao/Belizon in French Guiana). For each system, and in collaboration with gold-miners association and with local populations, pristine and mining areas were investigated and also downstream when possible. Various compartments were considered. In aquatic systems, sediments, suspended and dissolved fractions as well as fish were sampled. In terrestrial environments, soil, litter, leafs and termites including their nests (in French Guiana) were collected. Total mercury, mercury speciation (organic mercury fraction) and mercury stable isotopes were analyzed in order to assess the sources and the distribution of Hg (between natural and anthropogenically-induced – mercury from ASGM erosion and liquid mercury) and the environmental impacts of ASGM in the Guianas.

References

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