

Mercury Contamination

There is growing concern about mercury exposure of human populations in the Amazon, even in regions far away from the suspected pollution source, the gold-mining operations (garimpos) (1). Bacterial activity in the aquatic system is responsible for the methylation of mercury in the environment, and methylmercury is then highly assimilable in the trophic chains, ultimately reaching humans through fish consumption (2).

Our research group is currently carrying out a study on nervous-system dysfunction associated with methylmercury exposure in villages along the Tapajos River (Para, Brazil), located 250 km and further downstream from the gold-mining activities. As part of the study, 5 researchers spent 3 weeks in April and May 1994 in the region and, like the inhabitants, we ate locally caught fish on a daily basis. In order to see if our exposure to mercury varied over this short period, we analyzed our own hair samples for mercury content over time. Hair mercury is considered to be a good bio-indicator, reflecting body methylmercury concentration (3).

Hair strands from the root were taken from the occipital region, at least one month following our return to Montréal, Québec, Canada. Analyses for mercury determination were conducted in the laboratories of the Environmental Research Chair of the University of Québec in Montréal, using Cold Vapor Atomic Fluorescence Spectrophotometry (CVAF). The strands were cut in one cm segments and each segment was analyzed for total mercury, according to the procedure described by Bloom and Fitzgerald (4) and adapted for hair. Analytical quality was ensured by including a Health Canada

sample standard of powdered hair in the series.

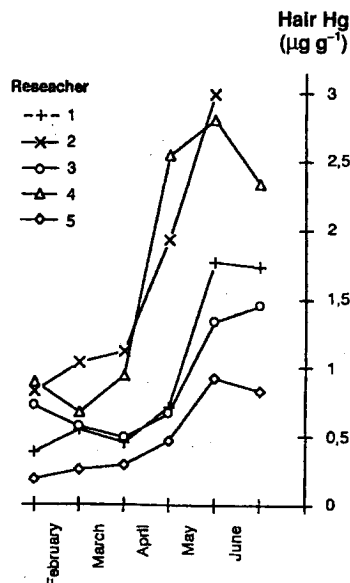
Mercury levels for each hair segment are presented in Figure 1, for all 5 researchers for the period of January to June 1994. For each researcher mercury hair concentration doubled or tripled during our trip to the Amazon. Mean concentration in the hair of the 5 researchers was $0.63 \text{ ppm} \pm 0.30$ in the month prior to the field trip. During our stay in the Tapajos River Region, there was a synchronous increase in hair-mercury levels for all researchers with an average level reaching $1.66 \text{ ppm} \pm 0.81$. The difference between the two periods is significant, using the Wilcoxon test ($W = 15$; $p < 0.05$). A tendency to decreasing mercury concentrations was observed following our return from Brazil.

These findings present a clear indication of exogenous mercury assimilation. The probability of external contamination with mercury vapor (Hg^0) is slight, since no visit was made to the garimpos. The most plausible explanation is the consumption of local fish containing methylmercury. This striking picture of *in vivo* methylmercury absorption points out the potential threat to populations living in this area, who may be continuously accumulating this organometal through the ingestion of river fish. Our results are consistent with the high levels of hair mercury already reported for populations living on the Tapajos River aquatic resources (5, 6). Further research is now needed to evaluate the anthropogenic contribution to the presence of mercury in this region and its effects on human health.

References

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Figure 1. Mercury levels for each hair segment of the 5 researchers between January and June 1994.



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