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Foliar mercury content from tropical trees and its correlation with physiological parameters *in situ*

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1 FOLIAR MERCURY CONTENT FROM TROPICAL TREES AND ITS CORRELATION WITH  
2 PHYSIOLOGICAL PARAMETERS *IN SITU*

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## 12 13 **ABSTRACT**

14  
15 The terrestrial biogeochemical cycle of mercury has been widely studied because,  
16 among other causes, it presents a global distribution and harmful biotic interactions.  
17 Forested ecosystems shows great concentrations from Hg and Litterfall is known as  
18 the major contributor to the fluxes at the soil/air interface, through the superficial  
19 adsorption on the leaves and by the gas exchange of the stomatal pores. The  
20 understanding of which processes control the stage of Hg cycle in these ecosystems is  
21 still not totally clear. The influences of physiological and morphological parameters  
22 were tested against the Hg concentrations in the leaves of 14 endemic species of an  
23 evergreen tropical forest in south-eastern Brazil, and an exotic species from *Platanus*  
24 genus. Pathways were studied through leaf areas and growing tree parameters, where  
25 maximum rate of net photosynthesis (Pnmax), transpiration rate (E), stomatal  
26 conductance (Gs) were examined. The results obtained *in situ* indicated a positive  
27 correlation between Pnmax and the Hg concentration; *Cedrela fissilis* and *Croton*  
28 *floribundus* were the most sensitive species to the accumulation of Hg and the most  
29 photosynthetically active in this study. The primary productivity from Tropical forest  
30 should be a proxy of Hg deposition from atmosphere to soil, retained there while  
31 forests stand up, representing an environmental service of sequestration of this global  
32 pollutant. Therefore, forests and trees with great photosynthetic potential should be  
33 considered in predictions, budgets and non-geological soil content regarding the  
34 global Hg cycle.

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37 *Keywords:* biodiversity hotspot; environmental features; mercury cycle; microclimate  
38 parameters; photosynthesis; tropical rainforest

- 39  
40
- 41 • The photosynthetic capacity of tree species is positive correlated with the  
42 foliar Hg content.
  - 43 • The local soil with a low Hg matrix rocks presents a top-down enrichment  
44 of Hg relative from atmospheric inputs by litterfall and throughfall.
- 45

## 46 **1. Introduction**

47  
48 In the past few decades, the importance of forest biomes to the global mercury (Hg)

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