Accumulation of polycyclic aromatic hydrocarbons (PHA) in plants exposed at the industrial city of Cubatão, São Paulo State, Southeastern, Brazil

Mirian Cilene Spasiani Rinaldi, Ana Paula Lopes Dias, Ricardo Keiichi Nakazato, Josmar Davilson Pagliuso & Marisa Domingos

1Núcleo de Pesquisa em Ecologia, Instituto de Botânica, São Paulo, SP, mspasiani@uol.com.br. 2Núcleo de Pesquisa em Ecologia, Instituto de Botânica. 3Escola de Engenharia de São Carlos, Universidade de São Paulo.

Vegetation plays a key role in cycling of many organic chemicals, such as PAHs. After deposition on vegetation, PAHs may alter antioxidants and induce oxidative stress. Biomonitor plants are suitable alternatives for assessing risks imposed by these pollutants to vegetation around industries, such as those found in Cubatão, which are surrounded by the Atlantic Rain Forest. Thus, this study evaluated the PAH accumulation on leaves of Lolium multiflorum ‘Lema’ (a standardized accumulator grass) and Tibouchina pulchra (a native tree species) growing in three sites at the Cubatão region (Site 1: away from the industrial emissions and next to a highway; Site 2: near an oil refinery and adjacent to a highway; Site 3: located in the city center and exposed to refinery emissions). Sites 1 and 2 are surrounded by the Atlantic Forest. T. pulchra plants were exposed during two 12 week periods (April to July and July to October 2009), and L. multiflorum cultures were exposed during six 4 week periods, coinciding with both of T. pulchra exposure. Twelve PAHs were analyzed. At the end of the first period, the ΣPAH concentration on L. multiflorum leaves ranged from 4472 (Site 1) to 7454 ng g⁻¹ (Site 2) and on T. pulchra leaves from 1083 (Site 1) to 1284 ng g⁻¹ (Site 2). After the second period, L. multiflorum growing in sites 1 to 3 accumulated more ΣPAH (2710, 9141 and 5981 ng g⁻¹, respectively) than during the first period. Similar increasing ΣPAH was also observed in T. pulchra (5657, 9669 and 4398 ng g⁻¹, respectively), which can be associated with the more intense vehicular traffic on the highways. Both biomonitor species indicated that the Atlantic forest next Site 2 is under higher risk associated with PAHs. The native tree species seems to be an appropriate risk indicator of these pollutants in the region.

Key words: HPAs, L. multiflorum, P. guajava, Cubatão.

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