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Contributions from vehicles and oil refinery to emissions of PAHs in the industrial city of Cubatão

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PAHs can be formed during the incomplete combustion of organic materials, such as oil, gas and wood. Due to the potential of plants to accumulate PAHs, it has been suggested their use as passive samplers in biomonitoring studies. Although *L. multiflorum* is one standardized grass for the biomonitoring of inorganic substances adsorbed on the atmospheric particulate matter, it has also been recommended as a biomonitor of PAHs. The leaf contents of individual PAHs in such biomonitor plant may be markers of their different emission sources. Therefore, the objectives of this work were: to verify the contamination of PAHs in two sites in the industrial city Cubatão (southeastern Brazil), by measuring the PAH accumulation on the leaves of *L. multiflorum*, and to determine possible source markers. Site 1 is away from the emissions of the industrial complex, but is next to a highway with heavy traffic toward the Atlantic coast. Site 2 is in the vicinity of an oil refinery. Cultures of *L. multiflorum* were exposed during twelve consecutive periods of 4 weeks each (April 2009 to April 2010). The following PAHs were analyzed: naphthalene(NAP), acenaphthene (ACE), fluorene (FLU), phenanthrene (PHE), anthracene (ANT), fluoranthene (FLT), pyrene (PYR), benzo[a]anthracene (BaA), chrysene (CRY), benzo[b]fluoranthene (BbF), benzo[k]fluoranthene (BkF) and benzo[a]pyrene (BaP). During the summer, increasing proportions of PAH, among them NAP, ACE, FLU, FEN, PYR, BaA, CRY, and BbF, were observed on the leaves of plants from the site 1 than in plants exposed in the site 2, indicating the predominance of vehicular emissions in the period, probably due to the large number of vehicles that moved along the highway toward the coast. During the winter, increased proportions of all PAHs were measured on the leaves of the plants exposed in the site 2, with respect to site 1.

Palavras-Chave: Polycyclic aromatic hydrocarbons, Cubatão, *L. multiflorum*, traffic emission, oil refinery emission.

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