Is the element accumulation in *Lolium multiflorum* indicate risks to the Atlantic Rain Forest due to changes in air contamination around an oil refinery in Cubatão - São Paulo?

Ricardo Keiichi Nakazato[1*], Mirian Cilene Spasiani Rinaldi[2] & Marisa Domingos[2]

[1]Núcleo de Pesquisa em Ecologia, Instituto de Botânica,São Paulo, SP, ricardo.nakazato@outlook.com. [2]Núcleo de Pesquisa em Ecologia, Instituto de Botânica.

The air contamination by pollutants around an oil refinery at the industrial complex of Cubatão (São Paulo – Brazil) changed as a consequence of the modernization of its model of power generation The system fueled by oil was substituted by one moved by natural gas, expecting an improvement of air quality and decreasing risks to the Atlantic Forest next to the refinery. We assumed that this change might be detected by the standardized grass culture (*Lolium multiflorum ssp. italicum* "Lema"), by assessing the leaf accumulation of S, N and trace elements in plants exposed over three periods (before, during transition and after the installation of the new energy source). From April/2009 to December/2012, plants were exposed repeatedly in five sites, three of them next to the forest and directly influenced by the refinery emissions and two affected by urban and refinery emissions. The data were treated by cluster analysis, which separated three main groups associated with the refinery emissions. Groups 1 and 2 (represented by increasing concentrations after the transition phase of V, Al, Cd, Cr, Co, Ni and of S, Zn, Cu. N, respectively) were related to sites near the forest. The concentrations of V and Ni, which are strongly related to petrochemical emissions, and of all other elements of group 1 have greatly increased in a single event during the post-installation phase, indicating a significant influence of emissions from the refinery processes on leaf accumulation. Decreasing levels of elements included in Group 3 (Se, B and Au) were observed from the transition phase on mainly in sites affected by both urban and petrochemical emissions. *Lolium* was effective to biomonitor risks to the Atlantic Forest, indicating that the new system for power generation for natural gas did not result in an improvement of air quality in the region.

Key words: air pollution, biomonitoring, Cubatão, *Lolium multiflorum*.