

nificantly increase the micronuclei rate in *T. pallida* ( $p < 0.01$ ) in the period of most burning. PAHs carcinogenic and/or mutagenic compounds such as benzo(a)pireno were identified. Thus, Trad-MCN was sensible and efficient, indicating that the exposure to organic PM emitted by biomass burning is capable of increasing DNA mutation rate on *T. pallida* significantly.

doi:10.1016/j.toxlet.2011.05.362

#### P1129

##### **Genotoxicity, quantification and composition of particulate matter from biomass burning in the eastern Brazilian Amazon region**

N. Alves<sup>1,\*</sup>, S. Batistuzzo<sup>1</sup>, P. Artaxo<sup>2</sup>, A.L. Loureiro<sup>2</sup>, P. Vasconcellos<sup>2</sup>, S. Hacon<sup>3</sup>

<sup>1</sup> UFRN, Natal, Brazil, <sup>2</sup> USP, São Paulo, Brazil, <sup>3</sup> FIOCRUZ, Rio De Janeiro, Brazil

Biomass burning introduces several pollutants into the atmosphere, including particulate matter (PM). The aim of this work was to assess the genotoxicity of PM with an aerodynamic diameter smaller than 10  $\mu\text{m}$  (PM10) in a Brazilian Amazon region, which suffers influences from sugarcane burning. Furthermore, to correlate PM10 and black carbon (BC) levels and made a characterization of the chemical composition of the PM by identifying and quantifying alkanes and polycyclic aromatic hydrocarbons (PAHs).

In the present study *Tradescantia pallida* micronucleus (Trad-MCN) (ex situ) bioassay was used to assess the genotoxicity of three different concentrations of organic PM collected in Tangará da Serra between August and December 2008. The levels of PM were determined by the difference in gravity analysis and BC was determined using a light reflectance technique. Furthermore, the alkanes and PAHs were identified and quantified by gas chromatography with flame ionization detection.

The Trad-MCN bioassay showed a significant increase in micronucleus frequency during the period of most intense burning, possibly related to the mutagenic PAHs that were found in such extracts. The PM and BC results indicate a strong correlation ( $p < 0.001$ ). The results of alkanes indicate an antropic influence. Among the PAHs samples, the retene was the compound in the highest quantity and it is an indicator of biomass burning. Among 16 PAHs identified, 12 are considered to be potentially mutagenic and/or carcinogenic. The ex situ Trad-MCN bioassay together with chemical analysis is thus recommended for characterizing genotoxicity of pollution air.

doi:10.1016/j.toxlet.2011.05.363

#### P1130

##### **Pesticide exposure and genotoxic evaluation: A case study in a Brazilian semiarid region**

V. Amaral<sup>1,\*</sup>, N. Alves<sup>1</sup>, A.F. Nagem<sup>1</sup>, M. Lira<sup>2</sup>

<sup>1</sup> UFRN, Natal, Brazil, <sup>2</sup> UFPI, Teresina, Brazil

Pesticides are extensively used in agriculture to control pest. The Brazilian government reported that in 2008 there was the highest market consumer for pesticides in the world. Besides, human exposure to pesticides has been associated with genetic damage. In the present study, micronucleus (MN) test in buccal mucosa cells was used to assess the genotoxicity of workers exposed to pesticides in soybean field in Bom Jesus (PI), a Brazilian semiarid region.

The MN test was carried out on the buccal epithelial cells of 56 men exposed and non-exposed to pesticides in 2008. For each individual, the presence of MN was evaluated in 2000 cells. A questionnaire detailing age, job activities and use of protective equipment were answered by each subject.

The data obtained from the questionnaire show the groups did not differ with respect to smoking habits ( $p = 0.23$ ) and alcohol consumption ( $p = 0.53$ ). With regard to the used of protective equipment, 63.4% asserted not use any kind of protection during the application of pesticides. However, the frequencies of MN were 2.9 for the exposed and 0.12 for the non-exposed groups ( $p < 0.001$ ). In addition, among the smokers, a statistically increase in the MN frequency was observed when it was compared both groups ( $p = 0.0005$ ). Also, in relation to alcohol consumption, pesticides workers revealed a significant induction of MN when compared to non-exposed group ( $p < 0.0001$ ). Thus, this study provided information about the genetic risk associated with pesticides exposure in soybean culture and shows the importance of educational programs and implementation of protection measures.

doi:10.1016/j.toxlet.2011.05.364

#### P1131

##### **Tradescantia micronucleus bioassay for the assessment of Golandim River's genotoxicity in São Gonçalo do Amarante (RN), Brazil**

V. Amaral\*, A. Paiva, R. Dantas, N. Barbosa, A.F. Nagem, N. Alves, G. Medeiros, S. Batistuzzo

UFRN, Natal, Brazil

The *Tradescantia* micronucleus test (Trad-MCN) is a sensitive, economic and simple bioassay for environmental monitoring. The Golandim River is located in São Gonçalo do Amarante, which is included in the metropolitan area of Natal city (Brazil). Industrial development and local activities have been polluting the river, decreasing the quality of the water and causing damages to the river's ecosystem and its surroundings. In the present study, chemical components and microbiological analysis were determined from collected water samples and in addition, its genotoxicity was evaluated by using micronucleus assay in *Tradescantia pallida*.

The samples were collected from three sites of Golandim River. The total and thermotolerant coliform bacteria were evaluated by the multiple tube technique and the metals were identified by flame atomic absorption spectrometry. The Trad-MCN bioassay was performed in a hydroponics system (ex situ).

The results showed that the microbiological analysis revealed high rates of contamination. Aluminum and lead were found in sites near urban areas with levels above the threshold established by World Health Organization (WHO). In addition, the Trad-MCN showed significant increase in micronucleus frequency in the site near urban area ( $p < 0.01$ ), possibly due to heavy metals that were identified and quantified. This study demonstrated that Trad-MCN was sensible and efficient in evaluating the genotoxicity of Golandim River's waters. The using of Trad-MCN together with microbiological and chemical analyses is highly important for monitoring environmental stations.

doi:10.1016/j.toxlet.2011.05.365