rat has been studied. Furthermore, gender differences observed in ascorbate protection have been reported. Male and female rats (200 ± 30 g) were simultaneously treated with arsenic trioxide (4 mg/100 g B.W.) and ascorbic acid (25 mg/100 g B.W.) on each alternate day for thirty days. Thereafter, observations on microsomal lipid peroxidation, reduced glutathione, oxidized glutathione, and glutathione-*S*-transferases were made. It was found that ascorbic acid treatments increased arsenic excretion, inhibited lipid peroxidation, improved GSH status, regulated GSSG turnover and also restored glutathione-*S*-transferases activity in liver and kidney. However, gender differences in all these observations were observed. It is concluded that ascorbic acid protection is controlled by gender dependent factors. The study is considered to be important from public health point of view.

doi:10.1016/j.toxlet.2006.07.047

P14-03

Sample pretreatment of trace toxic metals prior to atomic absorption spectroscopy for evaluation of different occupational exposures

Seyed Jamaleddin Shahtaheri, Monireh Khadem, Farideh Golbabaei, Abbas Rahimi-Froushani

Tehran University of Medical Sciences, Iran

Heavy metals are important constituents widely used in different industrial processes for production of various synthetic materials. For evaluation of workers' exposure to trace toxic metals, including Pb, Hg, Cd, Cr, Co, Cu, and Ni, environmental and biological monitoring are essential processes, in which, preparation of samples is one of the most time-consuming and error-prone aspects prior to analysis. The use of solid-phase extraction (SPE) has grown and is a fertile technique of sample preparation as it provides better results than those produced by liquid-liquid extraction (LLE).

To evaluate factors influencing quantitative analysis scheme of toxic metals, solid phase extraction using minicolumns filled with different sorbents including various Chromosorbs (102, 105) and XAD resins (2, 4, and 7) was optimized with regard to sample pH, ligand concentration, loading flow rate, elution solvent, sample volume (up to 500 ml), elution volume, amount of resins, and sample matrix interferences. Trace metal ions were retained on different solid sorbents and were eluted simultaneously with 10–20 ml 1 M HNO_3 followed by simple determination of analytes by using flame atomic absorption spectrometery. Obtained recoveries of metal ions were more than 96%. The amount of the analytes detected after simultaneous preconcentration were basically in agreement with the added amounts.

The optimized procedure was also validated with three different pools of spiked urine samples and showed a good reproducibility over six consecutive days as well as six within-day experiments.

The developed method promised to be applicable for evaluation of other metal ions present in different environmental and occupational samples as suitable results were obtained for relative standard deviation (less than 10%), therefore, it is concluded that, this optimized method can be considered to be successful in simplifying sample preparation for trace residue analysis of heavy metals in different matrices for evaluation of occupational and environmental exposures.

doi:10.1016/j.toxlet.2006.07.048

P14-04

Arsenic induced clastogenicity: Modulation by functional-food Jaggery

Nrashant Singh, Deepak Kumar, A.P. Sahu

Division of Preventive Toxicology, Industrial Toxicology Research Centre, Mahatma Gandhi Marg, Lucknow 226001, India

Water, a most essential component of life, contaminated with arsenic, is global human health hazard. Vast majorities of developing countries are forced to drink, only available arsenic contaminated water, resulted in multifactorial dysfunctions including mutagenicity and genotoxicity. There is no effective remedial action of chronic arsenicosis, despite it; a well-nourished diet can modulate the delayed effect of arsenic in drinking water. Functional-food Jaggery has enormous wealth of protein, vitamins and minerals and has great nutritive and additional medicinal value as reported in Indian-Ayurveda. It also has the anti-toxic and anti-carcinogenic activity.

The present research work aimed to evaluate the potential of Jaggery against the clastogenic effect induced by arsenic. Forty mice were grouped as, Group-I served as Control; Group-II arsenic as arsenic trioxide (12.9 mg/kg body weight); Group-III arsenic along with Jaggery (250 mg/mice) and Group-IV Jaggery alone. Mice were exposed to arsenic through subcutaneous route (s.c.) on days 1, 7, 14, 21 and 28 and mice were sacrificed and chromosomal preparations were made from bone-marrow cells. The cytogenic endpoints studied were on chromosomal aberrations and damaged cells. As-usual, chromosomal aberrations were more pronounced in arsenic treated mice (Group-II), while co-