Inorganic contaminants of bee pollen from states in Northeastern Brazil

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Bee pollen is sensitive to environmental pollution and may be considered as a bioindicator. It is subject to contamination with inorganic elements. Since the product is used as a diet supplement, the levels of these elements should be monitored to ensure safety. In this work the concentration of Al, As, Ba, Cd, Co, Cr, Ni, Pb, Sb and Hg was determined in 57 samples of dehydrated bee pollen collected from 11 sites from four Brazilian Northeastern states (Bahia, Sergipe, Piauí and Ceará) during a year. Analyses were performed using a validated methodology which included digestion of the samples in a closed microwave-assisted system and quantification of the trace elements by ICP OES. The ranges of the mean levels were: Al(0.1-94.0 mg/kg), As(<0.01-2.39 mg/kg), Ba (<0.001-10.6 mg/kg), Cd(<0.001-0.083 mg/kg), Co(<0.01-0.64 mg/kg), Cr(<0.01-0.70 mg/kg), Ni (0.01-1.36 mg/kg), Pb(<0.01-0.50 mg/kg), Sb(<0.035-1.54 mg/kg) and Hg(<0.0004-0.0044 mg/kg). The results corroborate our previous study with bee pollen samples from Southeastern states that showed greater pollution in urban areas. The Northeastern samples presented significantly lower levels of Al, Ba and Ni, indicators of industrial activities, than those of samples from the Southeastern states, in agreement with the fact that Southeastern Brazil is much more industrialized than the Northeastern region.