**Abstract**

Herbal preparations used to treat human ailments globally can be contaminated with various heavy metals (HMs) originating from the raw materials or from the manufacturing processes. Therefore, we assessed 22 medicinal plants growing naturally on tannery pollutant contaminated (Site-C) and non-contaminated (Site-NC) sites for their ability to accumulate chromium (Cr). The Cr contents in soil and various plant parts were estimated using an atomic absorption spectrophotometer. Translocation and bioconcentration factors were calculated. The soil at Site-C had 27-fold higher concentration of total Cr than at Site-NC. Chromium accumulation is reported for the first time in 50 % of the medicinal plants examined and varied significantly among the sites. Shoots of *Ricinus communis* and *Amaranthus* *viridis* had maximum concentrations of Cr at Site-C, whereas in Site-NC, none of the plants had Cr accumulation >30 ppm. *Ricinus* *communis*, *Amaranthus* *viridis*, and *Amaranthus* *spinosus* had translocation factor (TF) greater than the one in the Site-C and *Lantana* *camara* had TF >1 in Site-NC. The bioconcentration factor (BCF) was >1 only for *Ricinus* *communis* at both the sites. The majority of the medicinal plants at Site-NC had Cr content exceeding the permissible limit of 2 ppm suggested for herbal raw material. The results of the study clearly emphasize the need for screening plants of therapeutic value for the presence of HMs even when collected from non-contaminated soils. Moreover, proportional allocation of Cr in different plant parts provided an insight on the safety of these parts when specifically used in herbal preparations.