Abstract

Trivalent chromium (CrIII) was not toxic, but in a certain concentration could cause stress and inhibition in plant growth. The aim of this research was to determine the level of tolerance phases in germination stage and early seedling stage in several varieties of *Sorghum bicolor* (L.) Moench affected by Cr(III) and to the effect of the different Cr(III) concentration on parameters germination and early seedling growth. To select the most tolerant *sorghum bicolor* varieties to chromium stress, an experiment was performed in a factorial scheme having a completely randomized design (CRD) with five replications. The varieties and chromium stress factors comprised 12 varieties and four levels of chromium stress (control, 50, 250 and 500 mg/l) with chromium trivalent, respectively. Results of the cluster analysis using *Ward minimum varians* with agronomic parameters showed that the Badik and UPCA varieties were tolerant plants (0.839). Hegari, Mandau, Keris, Keris m3, Kawali, Sangkur and Batari was moderate varieties (0.758). While Gambela, Numbu, and Selayer was sensitive varieties (0.671). Results indicate that germination percentage, root length and dry weight tended to decrease with increase of Cr(III) concentration. Chromium trivalent has significant impact on root length, dry weight and GTI at concentrations above 250 mg/l.

keyword: Cr(III), *Sorghum bicolor*, *Growth tolerance index*, Cluster analysis, germination and early seedling growth.