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PHARMACOGNOSIE

Pomegranate juice attenuates neurotoxicity and histopathological changes of the nervous system induced by aluminum in mice

L. Gadouche · N. Djebli · K. Zerrouki
Pharmacognosy Api-Phytotherapy Laboratory (LPAP), Department of Biology, Faculty of Natural Sciences and Life, University of Abdelhamid-Ibn-Badis, Mostaganem, Algeria

Abstract

Aluminum (Al) is an element with ubiquitous neurobehavioral, neurophysical, and neurochemical changes linked to its bioavailability. The purpose of the present study was to determine the neuroprotective potential of pomegranate juice on Al induced neurotoxicity. Three groups of 7 female albino Swiss mice were used: the control group received only drinking water; the positive control group was exposed daily to 500 mg/kg of AlCl3 orally; and the third treated group received pomegranate juice (v/v in water) supplied in dark bottles for 4 h/day followed by
AlCl3 at a dose of 500 mg/kg orally for 20 h/day for 90 days. After 90 days, the mice were subjected to behavioral and memory tests. Cortex cerebral and hippocampus
injuries were determined with hematoxylin and eosin staining and Al accumulation was measured by graphite furnace atomic absorption with Zeeman correction. The Al deposition in the brain caused neural degeneration and decreased cell density inducing a state of anxiety, depression, and a deficit of learning and memory. Pomegranate juice treatment attenuated neurobehavioral alterations, decreased Al in the brain and restored the histological structure. Highperformance liquid chromatography with a diode-array detector (HPLC-DAD) revealed a range of bioactive molecules (i.e., gallic acid, quercetine, luteolin) in the pomegranate
juice that may have neuroprotective value for the nervous disorders caused by Al intoxication.

Keywords Pomegranate juice · HPLC-DAD · Aluminum · Neurotoxicity · Histopathology