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Genotoxicity evaluation of aqueous extracts of *Cotoneaster discolor* and *Alhagi pseudoalhagi* manna by comet assay

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Background and Aims: Cotoneaster discolor and Alhagi pseudoalhagi are two important Iranian manna. They have several therapeutic applications in adults and children. The most important ingredient of Cotoneaster discolor is mannitol. Alhagi pseudoalhagi consists of at least %80 sacchariferous based on its glucose content. Due to the scarcity of toxicological studies on these manna, their genotoxicity was evaluated.
Methods: Comet assay technique was selected to assess the genotoxicity, as it is a fast, sensitive, inexpensive and easy to perform method. In this method cell suspension is placed on slides, then the cell suspension would be lysed by lysis solution, electrophoresed dyed. The comets were assessed using fluorescence microscopy. In analyzing of the images, tail length, %DNA in tail and tail moment were measured and DNA damage was evaluated.
Results: Our findings showed that A. pseudoalhagi, C. discolor, glucose and mannitol caused DNA damage at concentrations of 5µg/ml, 100mg/ml, 25mg/ml and 50mg/ml, respectively.
Conclusions: Common dosage for A. pseudoalhagi is 100 mg/kg three times daily and for C. discolor is 50 mg/kg for children and 150 mg/kg for adult. The results of the current study suggest that taking mannitol, C. discolor and glucose in their common dosages in traditional medicine is safe while taking high amounts of A. pseudoalhagi (ten times more than common dosage) is not recommended. The harm caused by A. pseudoalhagi is not related to glucose and nonsugary components might be responsible for this damage. It is noteworthy that almost all substances in high concentrations may cause DNA damage. DNA damage in the alkaline comet assay might be impermanent and hence not necessarily results in mutation. Consequently, other genotoxicity tests should be performed on these substances. A. pseudoalhagi samples which is sourced from the other parts of the country may be checked by similar tests as well.

Keywords: *Alhagi pseudoalhagi*; *Cotoneaster discolor*; Comet assay