Human erythrocytes are affected in vitro by flavonoids of Aristotelia chilensis (Maqui) leaves.

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Source

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Abstract

Aristotelia chilensis (Mol.) Stuntz (A. chilensis), also known as maqui, is a plant of the Elaeocarpaceae family that grows in central and southern Chile as well as southwestern Argentina. Infusions of its leaves have long been used in the traditional native herbal medicine to treat different ailments. Phytochemical studies of the plant's chemical composition of the plant indicate the presence of indolic alkaloids, flavonoids, cianidine glucosides, delfidine, malvidine, petunidine, cumarines and triterpenes. These compounds, particularly the flavonoids, have antioxidant properties. In order to evaluate the mechanisms of its toxicity and their antioxidant properties, the leaves' aqueous extracts were induced to interact with human red cells, their isolated unsealed membranes (IUM), and molecular models of the human erythrocyte membrane. These consisted of multibilayers of dimyristoylphosphatidylcholine (DMPC) and dimyristoylphosphatidylethanolamine (DMPE), representative of phospholipids classes located in the outer and inner monolayers of the human erythrocyte membrane, and large unilamellar vesicles (LUV) of DMPC. The capacity of A. chilensis aqueous extracts to perturb the bilayer structure of DMPC and DMPE was evaluated by X-ray diffraction, DMPC LUV and IUM were studied by fluorescence spectroscopy, and intact human erythrocytes were observed by scanning electron microscopy (SEM). Results of the present study indicate that aqueous extracts of A. chilensis induced an alteration of human erythrocyte morphology from the normal discoid shape to an echinocytic form, changes that are explained in terms of the extract interaction with the membrane's outer phospholipid monolayer.