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Document Title : *Cardiac glycosides from lacticiferous plants as inhibitor of calf brain sodium - potassium atpaso*

الجليوسيدات القلبية من النباتات اللبنية كمثبطات للصوديوم - بوتاسيوم اثيبيز في مخ العجل

Document Language : Arabic

Abstract : The main objective of this work was to evaluate the pharmacodynamic action of naturally occurring cardiac glycosides (CGs) on synaptosomal Na+, K+-ATPase of calf-brain. CGs were extracted from lattices of Calotropis pro cera and Nerium oleander and were determined quantitatively as digoxin equivalent. Total CGs content present in both plants was determined quantitatively by the 2, 2, 4, 4-tetra- nitrodiphenyle (TNDP) reagent. The total CGs content was equivalent to 68 and 1169 mg digoxin/g of dried latex extract, respectively. Both plant CGs showed potent enzymic inhibition as compared to ouabain, a standard Na+, K+-ATPase inhibitor. Lineweaver-Burk plots of the In vitro inhibition of Na+, K+-ATPase revealed that; (1) Na+, K+-ATPase activation by A TP was inhibited by ouabain, C. procera and N. oleander latex extracts; (2) ouabain and C. pro cera latex extract produced a similar inhibitory pattern with a significant decrease in the apparent maximum velocity (V max) while the Michaelis constant (Km) values remained almost constant; (3) N. oleander latex extract produced a different inhibitory pattern with a significant decrease in both V max and Km values. These results of substrate and inhibitor kinetic studies of the neural enzyme, revealed the existence of at least two active sites, one for the substrate (A TP) and the other for glycoside binding which confirms previous studies. The Lineweaver-Burk analysis of the mode of inhibition indicated two type of reversible inhibition; (1) noncompetitive inhibition with regards to ouabain and C. procera latex extract; (2) uncompetitive inhibition with regards to N. oleander latex extract. These results are of atmost importance to understand the mode of enzymic inhibition for the development of heart drugs from natural digitalis-like substances. The main objective of this work was to evaluate th pharmacodynamic action of naturally occurring cardiac glycosides (CGs) on synaptosomal Na+, K+-ATPase of calf-brain. CGs were extracted from lattices of Calotropis pro cera and Nerium oleander and were determined quantitatively as digoxin equivalent. Total CGs content present in both plants was determined quantitatively by the 2, 2, 4, 4 -tetra- nitrodiphenyle (TNDP) reagent. The total CGs content was equivalent to 68 and 1169 mg digoxin/g of dried latex extract, respectively. Both plant CGs showed potent enzymic inhibition as compared to ouabain, a standard Na+, K+-ATPase inhibitor. Lineweaver-Burk plots of the in vitro inhibition of Na+, K+-ATPase revealed that; (1) Na+, K+-ATPase activation by A TP was inhibited by ouabain, C. procera and N. oleander latex extracts; (2) ouabain and C. pro cera latex extract produced a similar inhibitory pattern with a significant decrease in the apparent maximum velocity (V max) while the Michaelis constant (Km) values remained almost constant; (3) N. oleander latex extract produced a different inhibitory pattern with

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