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Anion transport in erythrocyte membrane in the presence of an organophosphorus insecticide and its methylated homologue

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The influence of the organophosphorus insecticide bromfenwinfos (2-bromo-1-(2,4-dichlorophenyl) vinyl diethyl phosphate) and its methylated homologue methylbromfenwinfos on chloride ($^{36}Cl^-$) and sulfate ($^{35}SO_4^{2-}$) equilibrium exchange in pig erythrocyte membrane was investigated. Bromfenwinfos at concentration of 50 and 100 μM and methylbromfenwinfos at 100 μM inhibited the chloride and sulfate exchange in a dose- and time-dependent manner. The effect was most pronounced for bromfenwinfos that for its homologue. Dixon analysis revealed noncompetitive character of the inhibition of the exchange of both anions with the apparent K_i values 202 and 540 μM for bromfenwinfos and methylbromfenwinfos, respectively in the case of chloride transport; for sulfate exchange, these values were 890 and 1720 μM. Bromfenwinfos and methylbromfenwinfos might inhibit the anion exchange indirectly by changing the fluidity of the erythrocyte membrane or directly by binding to the Band 3 protein and evoking conformational changes that lead to the inhibition of the anion transport.