

Summary

***In vitro* reactivation of cholinesterases after pesticides inhibition**

Organophosphate pesticides are toxic substances supplied commercially as insecticides in order to protect agricultural commodities, for suppression of epidemic events etc. The use of pesticides in the Czech Republic is strongly regulated by law similarly as in the whole EU. The regulation is aimed at monitoring and regulating the use of products containing toxic pesticides. In this diploma work, I measured the efficacy of previously synthesized oxime reactivators using the standard spectrophotometric method and multi-channel spectrophotometer. After experimental testing, the ability of selected pesticides to inhibit acetylcholinesterase (AChE) was assessed. I choose three pesticides that are capable of binding to AChE without any metabolic activation. It was paraoxon ethyl, paraoxon methyl, and DFP. Subsequently, I experimentally observed the ability of 78 selected oximes reactivators to restore AChE activity *in vitro*. I proved that the DFP inhibited AChE can be reactivated with high efficacy using monopyridinium reactivators but bispyridinium reactivators are also suitable. In contrast to DFP, paraoxon ethyl as well as paraoxon methyl inhibited AChE was reactivated with only bispyridinium reactivators. Number of oxime groups isn't significantly important factor in the efficacy of these reactivators for recovery of AChE activity after paraoxon methyl and ethyl inhibition. In a conclusion, the most suitable oxime reactivators were chosen and recommended for the future *in vivo* tests.