NEUROTOXIC EFFECTS OF SELECTED PESTICIDES BY ALTERING CHOLINESTERASE ACTIVITY

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Acknowledgment: This study was supported by the Croatian-Chinese Scientific and Technological Cooperation (2019-2021) partially by the Croatian Science Foundation (IP-2018-01-7683).

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**NEOTROPIC EFFECTS OF SELECTED PESTICIDES BY ALTERING CHOLINESTERASE ACTIVITY**

Intoxication with pesticides mainly leads to inhibition of the nervous system and can cause several severe health effects and illnesses, ranging from respiratory problems, muscle twitches, convulsions, etc.

**THERAPY**

Current therapy in case of organophosphate exposure consists of oximes (2-PAM, HI-6, or obidoxime), anti-muscarinic and muscles relaxant drug. Oxime can reactivate OP inhibited cholinesterase by nucleophilic displacement of phospho moiety from the ChE active site catalytic serine.

**ORGANOPHOSPHATE PESTICIDES**

Phosalone is a large molecule, creating interactions with the choline binding site and peripheral anionic site at active site entrance. Somewhat smaller phenamidophos shows similar binding pattern with π-π interactions between aromatic ring and Trp86.

Ethoprophos has higher inhibition impact compared with phosphoramidates (metamifos and phenamidophos) or with organothiophosphate (phosalone).

**CONCLUSION**

- Molecular docking of pesticides with AChE active site residues revealed possible orientation of inhibitor. Inhibition constants determined with in vitro experiments are in alignment with defined orientation suggesting highest inhibition rate by ethoprophos.
- Detailed reactivation kinetics showed better efficiency of oxime 14A in case of methamidophos inhibited AChE, but obidoxime as standard therapy is more efficient reactivator for both pesticides.

**FUTURE AIMS:**

- Attain better comprehension and intervention solution for intoxication with all named pesticides.