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The Importance of Rotenone in Generating Neurological and Psychiatric Features in Zebrafish - Relevance for a Parkinson's Disease Model

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Abstract. The predisposition of people to contact or manifest certain diseases is growing. Chemical resistance mixed with other harmful sources could represent one of the causes for the disease appearance. Environmental toxins like rotenone are frequently used in agriculture or in fish extermination to control the soil or water fauna population. Despite the beneficial effects in these cases, acute or chronic exposure to rotenone can be dangerous for non-target organisms and humans. Analyzing different poisoning rotenone stages, it was concluded that rotenone can be an inhibitor mitochondrial complex I, which is a cause of Parkinson's disease (PD). Trying to identify the most important facts about PD, animal models were used in experiments. This review is focused on rotenone description, its effects on organisms and its ability to induce the specific symptoms in people affected by PD.

Abbreviations: PD - Parkinson's disease, ROS - oxygen reactive species, YOPD - young-onset Parkinson's disease, MPTP - 1-methyl-4-phenyl-1,2,3,6-tetrahidropyridine, 6-OHDA - 6-hydroxydopamine

Keywords: rotenone, Parkinson's disease, dopaminergic neurons, zebrafish, model organism

Introduction

A wide range of organic chemicals are used in the world to control a variety of unwanted organisms from soil, water, plant pests or even other organisms. The majority of chemicals often are dangerous due to active substance which is mixed with other substances. The negative consequences are influenced by the abiotic factors such as: light, temperature, humidity and water (Speight, 2017). Also, the persistence of the compound in the environment (Webster et al., 1998). Trying to create new compounds specialized in prevention or eradication of some disturbing organisms, the equilibrium of biocoenosis is disrupted. Beside affecting non-target organisms, even humans are exposed to negative impact of organic chemicals. These compounds can be classificated in natural and synthetic compounds.