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Antioxidant Effect of *Cressa cretica* Ethanolic Extract against Oxidative Process Induced by Methidathion Pesticide in Male Rats

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Abstract | The study aimed to determine the effect of chronic methidathion (MD) administration on the hepatic integrity of rats and the properties of *Cressa cretica* alcoholic extract in preventing MD-induced hepatic damage. Male rats were randomly divided into five groups of ten each: the first group (I) served as a control which received distilled water only, the second group (II) received 1/10 LD_{50} MD, the third group (III) received 1/20 LD_{50} MD, the fourth group (IV) were administered 1/10 LD_{50} MD + *Cressa cretica* alcohol extract, while the fifth Group (V) had 1/20 LD_{50} MD + *Cressa cretica* alcohol extract solution daily for 100 days. The study also investigated the active chemical compounds present in the alcoholic extract of *Cressa cretica*, which were responsible for the protective effect against hepatotoxicity resulting from chronic methylation exposure for 100 days. These compounds were also identified through phytochemical analysis. Additionally, biochemical analysis and histopathological studies were conducted. The histopathological results of the liver were consistent with the biochemical results. Based on all the results, the study concluded that the alcoholic extract of the herb represents a potential source of a natural antioxidant against the chronic toxic effects of methidathion in male rats.

Keywords | Liver, Methidathion, *Cressa cretica*, Antioxidant effect, Chronic toxicity, Rat

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INTRODUCTION

The liver is a key organ that helps mammals with their metabolism and can regenerate itself after losing mass due to exposure to harmful chemicals or infectious agents, as long as the dose is kept within a safe range (Zgheib and Branch, 2017; Al-Dleamy and Jawad, 2022). Chronic exposure to harmful substances or infectious agents, if left untreated, can cause the liver to undergo fibrosis, cirrhosis, and eventually failure (Zgheib and Branch, 2017; Kullak-Ublick *et al*., 2017).

The excessive and global use of pesticides, particularly in agricultural and public health initiatives, has polluted the environment and had numerous harmful impacts on human and animal health. One of the most prominent groups of pesticides used since the mid-1940s is organophosphate insecticides, also known as OPIs (Joshi and Rajini, 2009). Due to their limited persistence in the mammalian system and relatively low toxicity, OPIs are commonly employed (Khan and Borchert, 2002). The predominant acute mammalian toxicity associated with OPI exposure is muscarinic and nicotinic syndromes, which result from