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### MEETING ABSTRACT

#### A2.2

##### Antioxidant and hepatoprotective activity of winter savory (*Satureja montana* L.) extract

Nikola MARTIĆ\*, Aleksandar RAŠKOVIĆ, Boris MILIJAŠEVIĆ, Milan UBAVIĆ and Marija VUKOMANOVIĆ

Department of Pharmacology, Toxicology and Clinical Pharmacology, Faculty of Medicine, University of Novi Sad, Serbia

**Background:** The presence of secondary metabolites such as flavonoids, sterols, essential oils and tannins in the *Satureja* genus has various medical properties. Recent studies indicated potentially useful pharmacodynamic effects of *Satureja montana* L., such as antifungal and antibacterial activity, antioxidant, antidiabetic, antihyperlipidemic, as well as expectorant and vasodilatory effects. The aim of our study was to investigate the influence of Winter savory extract on biochemical parameters of liver and kidney function in serum, and antioxidant potential in rats exposed to oxidative stress using toxic doses of paracetamol.

**Methods:** The research was conducted on half-mature Wistar rats, divided into four groups of 6 animals each. The animals were pretreated orally for 7 days with Winter savory extract and saline followed by a toxic dose of paracetamol (600 mg/kg). Rats were sacrificed by cardiopunction, then blood and liver samples were taken to determine biochemical parameters of oxidative stress in serum and in the liver homogenate.

**Results:** The application of a toxic dose of paracetamol significantly increased the activity of liver transaminases in the serum compared to control ( $p < 0.05$ ). Winter savory extract prevented the damage of liver tissue measured by the activity of oxidative stress enzymes, which was significantly higher in animals that were not pretreated with the extract before the toxic doses of paracetamol. Indicators of hepatic and kidney functions, as well as the concentration of oxidative stress enzymes, were significantly lower in animals that were pretreated with Winter savory extract compared with the group that received paracetamol alone.

**Discussion:** The results of this study showed that hepatotoxicity induced by a toxic dose of paracetamol was revealed by significant increase in activity of liver transaminases. The use of paracetamol toxic dose in the group pretreated with physiological saline led to a statistically significant increase in alkaline phosphatase (ALP) activity, alanine aminotransferase (ALT), and aspartate aminotransferase (AST) in rat serum compared to control. Activity of liver transaminases were lower in group of animals that were treated with Winter savory extract before paracetamol compared to animals that were treated with saline and paracetamol. Concentrations of malondialdehyde (MDA), catalase (CAT), glutathione reductase (GR) and superoxide dismutase (SOD) in rat serum were higher in the group of animals that were treated with toxic dose of paracetamol compared to animals pretreated with Winter savory extract before paracetamol. The results of our study are in accordance with the results of earlier studies using an *in vitro* model. The toxic dose of paracetamol leads to a significant disorder of biochemical parameters, liver and kidney function indicators and oxidative stress indicators. Pretreatment with Winter savory extract prior to the administration of the toxic dose of paracetamol improves biochemical and oxidative stress parameters. Improvement of antioxidant properties

could be explained by the presence of different phenolic and terpenic compounds.

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\*Corresponding author e-mail: [martcnikola@uns.ac.rs](mailto:martcnikola@uns.ac.rs)