ABSTRACT

Adamu Ayubu, 2020. Antioxidant and hepatoprotective activity of ethanol extract of red okra pods (*Abelmoschus esculentus* (L.) Moench) against sodium nitrite-induced liver injury in mice (*Mus musculus*). This thesis is under the supervision of Prof. Dr. Sri Puji Astuti Wahyuningsih, M.Si., and Dr. Dwi Winarni, M.Si., Department of Biology, Faculty of Science and Technology, Airlangga University, Surabaya.

Vegetable, drinking water and cured meat may contain sodium nitrite ($NaNO_2$) that causes liver diseases through the induction of oxidative stress. To treat liver diseases, phytochemicals are highly recommended as an alternative to synthesized drugs and surgery because they have less or no adverse effects. The study intended to determine the antioxidant and hepatoprotective potential of the ethanol extract of red okra pods against liver injury induced by $NaNO_2$.The extraction of phytochemicals from the okra pods used n-hexane, ethyl acetate and ethanol. The study used a completely randomized design where 36 male mice were separated into six groups each had six mice. The groups were normal control (KN) which was given distilled water only and negative control (K-) which was given 50 $NaNO_2$ together with distilled water. The other four groups (P1, P2, P3 and P4) were received 50 $NaNO_2$ mg/kg BW and the ethanol extract of red okra at the dosage of 25, 50, 75 and 100 mg/kg BW respectively. The $NaNO_2$ and extract of red okra pods were dissolved in distilled water to make a solution prior to treatment. The treatments were done by oral gavage in consecutive 21 days. All biochemical parameters were determined by commercial kits as per manufacturers' instructions. Staining of the liver tissues followed the standard protocols using hematoxylin and eosin. All data were analyzed statistically by using Statistical Package for the Social Sciences (SPSS) 26.00 for windows. The administration of $NaNO_2$ decreased the activity of the antioxidant enzymes (superoxide dismutase (SOD), catalase (CAT)), increased the activity of hepatic enzymes as well as decreased the concentration of total serum protein (TSP). Also, the mice group given $NaNO_2$ alone showed alteration of the normal architecture of the liver as marked by inflammation, an increased percentage of cell swelling and necrosis as well as a decreased percentage of normal cells of the K- compared to KN. The administration of ethanol extract of red okra pods generally restored the biochemical parameters and histological structures compared to K-. The results obtained from this study showed that the ethanol extract of red okra pods can be used as an antioxidant and hepatoprotective agent in the liver injury induced by $NaNO_2$.

Keywords: Red okra, Hepatoprotective, Antioxidant, Sodium nitrite, Liver, Oxidative stress, Free radical