ABSTRACT

Ulfah Nuraini, 24020120410002, **The Effect of Exposure to Neem Leaf Ethanol Extract Nanoparticle Preparation on the Structure and Function of Male Sprague Dawley Rat Kidneys**. Master of Biology. Faculty of Science and Mathematics. Diponegoro University. Supervised by Agung Janika Sitasiwi and Sri Isdadiyanto.

Technological advancements in the development of herbal plants for medicinal purposes are continually progressing in Indonesia. The public perceives herbal medicines as safer, more practical, and cheaper compared to synthetic drugs, and the desired herbal ingredients are readily available. Neem (*Azadirachta indica* A.Juss) is a herbal plant with high antioxidant content and potential medicinal properties. One challenge with oral administration is the low bioavailability and distribution of the active compounds in herbal medicines. To address this issue, herbal plant extracts can be packaged into smaller particles. This study aimed to examine the effect of exposure to the histological structure and kidney function of male white rats (*Rattus norvegicus* L) through the administration of chitosan- nanoparticle preparations of neem leaf ethanol extract (*Azadirachta indica* A.Juss). The study used 32 rats aged 2 months, divided into 4 treatment groups, each with 8 repetitions: K- (normal rats induced with 2 ml of distilled water), K+ (normal rats induced with 2 ml of NaTPP and chitosan), P1 (normal rats induced with chitosan nanoparticles: neem leaf ethanol extract 1:0.5), and P2 (normal rats induced with chitosan nanoparticles: neem leaf ethanol extract 1:1). The research design used a Completely Randomized Design (CRD), and the analysis was performed using ANOVA with a 5% significance level. Data that were not normally distributed were analyzed using the non-parametric Kruskal-Wallis test to determine the effect, using SPSS software version 24. The results showed that the administration of chitosan-nanoparticle preparations of neem leaf ethanol extract at 1:0.5 and 1:1 ratios had no significant effect on glomerular diameter, Bowman capsule diameter, kidney weight, creatinine levels, and MDA levels ($p>0.05$). It can be concluded that the administration of chitosan-nanoparticle preparations of neem leaf ethanol extract (*Azadirachta indica* A.Juss) does not have a significant impact on the kidneys. Therefore, it can deliver the bioactive compounds of neem leaves to the target organ, the kidneys, while minimizing histological and functional kidney damage in male white rats (*Rattus norvegicus* L) due to the antioxidant compounds in neem leaves.

Keywords: *Nanoparticles, Azadirachta indica, Glomerular, Bowman Capsule, Creatinin, MDA*.