ABSTRACT

Muhammad Alwan Sunny. 24020124410013. Safety Assessment of Polyethylene Terephthalate (PET) Microplastics on Complete Blood Count and Tumour Necrosis Factor Alpha (TNF-α) Expression in Wistar Rats. Supervised by Agung Janika Sitasiwi and Kasiyati

Exposure to polyethylene terephthalate (PET) microplastics can cause an imbalance in the gut microbiota (dysbiosis), trigger fragmentation into nanoplastics, and activate an immune response that promotes the release of pro-inflammatory cytokines such as TNF-α. Most studies have so far focused on the detection of microplastics in human blood or on the effects of other types of microplastics, such as polystyrene and polyethylene, but research into the toxic effects of PET microplastics on complete blood counts and systemic inflammatory markers remains limited. This study aims to analyse the effects of PET microplastic exposure on complete blood counts and TNF-α levels in Wistar rats. A total of 20 rats were divided into four treatment groups: P0 (control), P1 (1.25 mg/kg body weight), P2 (12.5 mg/kg body weight), and P3 (62.5 mg/kg body weight), which were administered a PET microplastic solution for 21 days. Blood samples were collected intracardially for haematological analysis using a haematology analyser, whilst TNF-α levels were measured using an ELISA kit (Reedbio). The results showed that all haematological parameters, including erythrocytes, leukocytes, and platelets, did not exhibit significant changes between groups. TNF-α levels also showed no significant differences between the control and treatment groups. This study concluded that exposure to PET microplastics at the dose and duration used did not cause haematological changes or systemic inflammation in Wistar rats.

***Keywords**: PET microplastics, complete blood count, TNF-α, Wistar rats, systemic inflammation*