ABSTRACT

Yusuf Cendrawan. 24020120130093. **Analysis of Collembola Community Structure and Soil Quality Using the QBS-Adapt Method in Post-Fire Land KHDTK Wanadipa UNDIP**. Under guidance of Rully Rahadian and Mochamad Hadi.

Forest fires can have significant impacts on soil structure, quality, and the overall ecosystem. This study aims to compare the structure of Collembola communities and assess soil quality in post-fire areas using the QBS-Adapt index for Collembola and various soil physical and chemical factors. The research was conducted in June 2024 in the KHDTK Wanadipa Undip area, Penggaron Forest, Semarang Regency, Central Java. Samples were collected from three different stations: a burned station (S-BA), an unburned station (ST-BA), and a reference area that remained natural and undisturbed. Collembola sampling methods included pitfall traps and transect lines. The structure of Collembola morphotype communities was analyzed using the Shannon diversity index (H'), Simpson's dominance index (D), and evenness index (e). Soil physical factors analyzed included temperature, humidity, porosity, bulk density, and texture, while chemical factors analyzed included C, N, P, K, CEC, and pH. Soil quality in the burned and unburned areas was assessed using the QBS-Adapt index based on Collembola morphotypes. The results indicate that the forest fire decreased the abundance of epigeic Collembola but increased the abundance of hemiedaphic and edaphic Collembola. The decline was particularly notable among dominant Collembola species, although the fire did not affect diversity at each station. The analysis of soil physical and chemical parameters showed that the surface fire did not significantly alter soil physical and chemical properties. According to the QBS-Adapt index, the unburned station exhibited the highest soil quality, followed by the burned station, with the reference station showing the lowest soil quality.

Keywords: *Collembola, KHDTK, Forest Fire, QBS-Adapt, Community Structure*