

**ABSTRACT**

**Effect of quercetin on behavioral perturbation and molecular changes induced by psychological stress model using predatory paradigm**

**Putri Anggreini**

**Background:** It is well known that oxidative stress plays a pivotal role in pathophysiology and pathogenesis of mental diseases such as depression or anxiety. Psychological stress induced by predatory stimulus is one of models that induce behavioral perturbation manifested as depression-like state. Quercetin is a flavonoid that exhibits potential pharmacological activity on mental diseases. Thus, the present study was designed to investigate the effect of quercetin on behavioral perturbation and molecular changes induced by predator stress exposure on mice.

**Method:** ICR mice were exposed to predatory stress (PS) for 7 days. Quercetin 50 mg/kg was given intraperitoneally. The freezing response during the stress induction was analyzed. The anxiety-like behavior, depressive-like behavior, and also cognitive function were examined on the last day of induction. Afterwards, the amygdala and hippocampus were processed to evaluate molecular changes related to oxidative stress.

**Results:** Predatory stress increased the depressive-like and also anxiety-like behavior accompanied with high innate fear response. Quercetin treatment ameliorated behavioral perturbation in predatory stressed mice. Compared to PS, quercetin reduced the depressive-like state, anxiety-like state, and also innate fear. Furthermore, PS decreased the level of p-Nrf2 and also mRNA SOD on amygdala and hippocampus. Quercetin treatment increased p-Nrf2 level on amygdala and hippocampus but not affected the mRNA SOD on amygdala and hippocampus.

**Conclusion:** Predator stress exposure cause both innate fear and depression-like state for the prey animals. Quercetin may have a protective effect against depression and alleviates the fear of traumatic event through the Nrf2 system.