

**ABSTRACT**

**EFFECT AND MECHANISM OF RED FRUIT ETHANOL EXTRACT  
(*PANDANUS CONOIDEUS LAM*) ON OVARIAN GRANULOSA CELL  
APOPTOSIS ENDOMETRIOSIS MICE MODEL THROUGH  
TNF $\alpha$ , NF-kB, CASPASE 3, HSP 70 AND SOD EXPRESSIONS ANALYSIS**

**AIM:** Purpose of this study was to prove whether the administration of red fruit extract therapy can reduce the incidence of apoptosis in ovarian granulosa cells of mice endometriosis model.

**METHODS:** This study used experimental research design, 27 mice of endometriosis model (BalB / c) was divided into 3 groups, each consist of 9 mice: normal mice group (K-), endometriosis model group received placebo (K+) and group of endometriosis model of mice given red fruit extract (P). samples were taken from the peritoneum to evaluate Tumor Necrosis Factor alpha (TNF $\alpha$ ) and Nuclear factor kappa beta (NF-kB) and ovaries for caspase 3, Heat shock protein (HSP70) and Superoxide dismutase (SOD).

**RESULTS :** Administration of red fruit extract decrease granulosa cell apoptosis. The index of ovaries granulosa cell apoptosis in mice of K+ group was significantly higher compared to P group (p <0.05). TNF $\alpha$  and NF-kB of endometriosis mice given red fruit extract was significantly lower than in the group endometriosis mice that received placebo (p <0.05). The decrease of TNF $\alpha$  do not have correlation with the decrease of NF-kB (B=0,001;p=0,684). Caspase3 in the positive control group increased significantly compared with the negative control group (p <0.05). The SOD expression in P group was significantly higher than the K+ group (p <0.05). HSP 70 levels in the K+ group were higher than in the P (p <0.05).

**CONCLUSION :** Red fruit ethanol extract decrease apoptosis of granulosa cells due to endometriosis, through the mechanism of decreasing TNF $\alpha$  and caspase3 expressions. There is increase of SOD, and decrease of NF-kB, TNF $\alpha$  and HSP70 after Red fruit ethanol extract administration. From pathway analysis shows that the decrease of NF-kB expression is not correlate with decrease of TNF $\alpha$ . And the increase of SOD expression also not correlate with decrease of granulosa cell apoptotic index . Administration of red fruit ethanol extract causing HSP70 expression decrease. The decrease of apoptosis is not correlate with HSP70 expression decrease.

*keyword:* Endometriosis, Ovarian granulosa cells, Apoptosis, Proinflammatory cytokines, Red Fruit.