

## ABSTRACT

*Phyllanthus niruri* L. (meniran) has already been reported to increased macrophages activities, lymphocyte cells proliferation and immunoglobulin titer (IgG) while *Piper crocatum* Ruiz & Pav. (sirih merah leaf) can increased macrophages activities but did not show effect against lymphocyte cells proliferation and immunoglobulin titer (IgG). The aim of this research was to evaluate the immunomodulator activity of combination from ethanolic extract of meniran and sirih merah leaf against macrophage phagocytation, lymphocyte proliferation and immunoglobulin titer (IgG).

The test was used 36 Sprague Dawley rats (6-8 weeks) with the body weight about 120 gram that divided into 6 groups include control of ethanolic extract of meniran (EMN), control of ethanolic extract of sirih merah leaf (ESM), control of DMSO, combination of EMN:ESM dose of 25:50 ; 50:100 and 75:150 mg/KgBW that induced by hepatitis B vaccine intraperitoneally. The treatment was done for 17 days and all of rats were sacrificed on the day 18. Macrophages were isolated from peritoneal cavity while lymphocyte cells from the spleen and the blood were collected from the ocular veins. The quantification of macrophages were done by microscope while the lymphocyte cells proliferation and immunoglobulin titer (IgG) measured by Optical Density (OD) that was read with ELISA Reader at  $\lambda$  550 nm and 450 nm.

The result shown that the combination of ethanolic extract of meniran and sirih merah leaf increased the lymphocyte cells proliferation but decreased macrophages phagocytosis index and did not show effect against macrophages phagocytosis capacities significantly than the control of DMSO. Against the immunoglobulin titer (IgG), the combination of ethanolic extract of meniran and sirih merah leaf did not increased significantly than the control of DMSO.

**Keyword :** *Phyllanthus niruri* L., *Piper crocatum* Ruiz & Pav., macrophage phagocytation, lymphocyte cells proliferation, immunoglobulin titer

## INTISARI

*Phyllanthus niruri* L. (meniran) diketahui mampu meningkatkan aktivitas fagositosis makrofag, proliferasi limfosit serta titer antibodi IgG sedangkan *Piper crocatum* Ruiz & Pav. (daun sirih merah) dapat meningkatkan aktivitas fagositosis makrofag tetapi tidak berpengaruh terhadap proliferasi limfosit dan titer IgG. Penelitian ini bertujuan untuk mengetahui aktivitas imunomodulator kombinasi ekstrak etanolik meniran dan daun sirih merah terhadap fagositosis makrofag, proliferasi limfosit dan titer antibodi IgG.

Sebanyak 36 ekor tikus jantan galur *Sprague Dawley* (SD) usia 6-8 minggu dengan bobot  $\pm 120$  gram dibagi menjadi 6 kelompok yaitu kontrol ekstrak tunggal meniran (EMN), kontrol ekstrak tunggal daun sirih merah (ESM), kontrol pelarut (DMSO), kelompok kombinasi EMN:ESM dosis 25:50 mg/KgBB, EMN:ESM dosis 50:100 mg/KgBB, EMN:ESM dosis 75:150 mg/KgBB yang diinduksi vaksin hepatitis B secara intraperitoneal. Perlakuan hewan uji selama 17 hari dan dilakukan pembedahan pada hari ke-18. Makrofag diisolasi melalui rongga peritoneum tikus, sel limfosit berasal dari organ limpa tikus dan darah diambil melalui vena mata. Kuantifikasi makrofag dilakukan dengan pengamatan di bawah mikroskop sedangkan proliferasi limfosit dan titer antibodi diukur melalui *Optical Density* (OD) yang dibaca dengan *ELISA Reader* pada  $\lambda$  550 nm dan 450 nm.

Kelompok kombinasi mampu meningkatkan proliferasi sel limfosit tetapi menurunkan indeks fagositosis makrofag, dan tidak berpengaruh terhadap kapasitas fagositosis makrofag dibandingkan dengan kelompok kontrol pelarut DMSO. Terhadap titer antibodi IgG, kelompok kombinasi juga tidak berbeda signifikan bila dibandingkan dengan kelompok kontrol pelarut DMSO.

Kata kunci : *Phyllanthus niruri* L., *Piper crocatum* Ruiz & Pav., fagositosis makrofag, proliferasi limfosit, titer antibodi