

**THE EFFECT OF PHYSALIS ANGULATA L
ON THE EXPRESSION OF BCL-2, APOPTOSIS,
AND NECROSIS AREAS IN WISTAR RAT LIVER CELLS**

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ABSTRACT

BACKGROUND: *Physalis angulata* L, known in Indonesia as “ciplukan”, is an annual shrub that belongs to the *Solanaceae* family. This plant is common in tropical and subtropical countries. Its extract or infusion has been used in many countries as popular medicine for treatments of varieties of diseases such as malaria, asthma, hepatitis, dermatitis and rheumatism. *In vitro* studies showed that purified compounds of *Physalis angulata* such as physalins and glycosides exhibited antitumoral activities on HA22T (hepatoma), HeLa (cervix uteri), leukemia, lung adenocarcinoma and epidermoid carcinoma of the nasopharynx KB-16 cell lines. This study aimed to examine the effect of *Physalis angulata* L extract on the expression of Bcl-2, apoptosis, and areas of necrosis in Wistar rat liver cells.

SUBJECT AND METHODS: This was a randomized control trial. A sample of 24 Wistar rats was divided into 4 groups: (1) Negative control group (K1); (2) Positive control group (K2) induced by CCl₄ 1% without “ciplukan” extract; (3) Treatment group (P1) induced by CCl₄ 1% with “ciplukan” extract 750 mg/KgBW; and (4) Treatment group (P2) induced by CCl₄ 1% with “ciplukan” extract 1.500 mg/KgBW. Carbon Tetrachlorida (CCl₄) compound was used to induce liver damage, including degeneration, necrosis, free radical formation, and lipid peroxidation. The treatment lasted for 14 days. Mean difference in the expression of Bcl-2, apoptosis, and necrosis of the liver cells, were compared and tested by One Way Anova and post-hoc test.

RESULTS: The mean differences in the expression of Bcl-2 ($p=0.045$) and areas of necrosis ($p<0.001$) among the three groups (P2, P3, and P4) were statistically significant. The expression of Bcl-2 as well as areas of necrosis was lower in P3 and P4 than P2. The mean differences in apoptosis ($p>0.05$) among the three groups (P2, P3, and P4) were not statistically significant.

CONCLUSION: *Physalis angulata* L (“Ciplukan”) extract treatment either 750 mg/KgBW or 1.500 mg/KgBW administered for 14 days significantly reduces the expression of Bcl-2 and areas of necrosis in rats.

Keywords: *Physalis angulata* L, expression of Bcl-2, apoptosis, necrosis