

ABSTRACT

**STUDY ON PHARMACODYNAMIC EFFECT OF ALKALOID
FRACTION OF *Achyranthes aspera* L ON THE EXPRESSION OF
PROTEINS CDK1, BAX AND RAS IN BENZOPYRENE-INDUCED MICE
BREAST CANCER CELLS**

Sunarni Zakaria

Non Communicable Diseases (NCD) is the cause of death in Indonesia. Cancer is one of non-communicable diseases that has become the world's health problems, including in Indonesia. Based on Indonesian Basic Health Research (Riskesmas) in 2007, cancer holds as the sixth leading cause of death. Currently there has been no ideal anti-cancer chemotherapy drugs able to eradicate all cancer cells without harming normal cells. Nevertheless, there has been a strong determination of the government to develop Indonesian herbal medicines, in particular the natural anti-cancer drugs (derived from plants). In the present study the plant to be studied was *Achyranthes aspera* L fractions, known to contain alkaloids as their active ingredient. The purpose of this study was to clarify that the provision of an alkaloid fraction of *Achyranthes aspera* L may decrease cdk1 protein expression as well as the Ras protein and increase bax protein expression. Statistical tests used for the examination of cdk1, bax, and Ras protein expression was the analysis of variance (ANOVA) and Chi-square test. In statistical tests of immunohistochemical examination cdk1 protein expression showed no significant differences among the five treatment groups. This conclusion suggests that the alkaloid fraction of *Achyranthes aspera* L in three doses (30,60,100 mg/kg BB) and methotrexate 15 mg/kg BB did not have the effect of lowering the expression of cdk1 protein. In immunohistochemical examination of Bax protein expression, statistical tests showed there were significant differences in five treatment groups and the conclusions showed that the alkaloid fraction of *Achyranthes aspera* L DIII (100 mg/kg BB) has an effect of increasing the expression of Bax protein. In immunohistochemical examination of ras protein expression, the statistical test showed that the alkaloid fraction of *Achyranthes aspera* L decrease Ras protein expression at all doses.

Keyword: mice with breast cancer, the expression of cdk1 protein, bax protein, ras protein