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Flavonoid Compounds From The Leaves Of *Kalanchoe Tomentosa* And Their Cytotoxic Activity Against P-388 Murine Leukemia Cell

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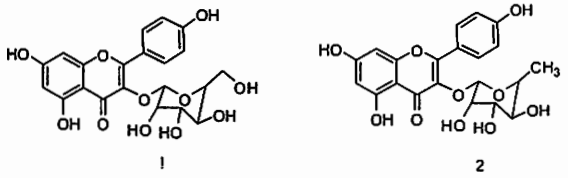
Abstract *Kalanchoe* plant, known as "sosor bebek" in Indonesia is a perennial herb and has succulent leaves. The plant is known in folklore and traditional medicine in Indonesia for the treatment of fever, abscesses, bruises, contused wounds, coughs and skin diseases. During the course of our continuing search for novel cytotoxic compounds, the methanolic extract of *Kalanchoe tomentosa* plants showed cytotoxic activity against P-388 murine leukemia cells. The methanolic extract of the fresh leaves of *K. tomentosa* was concentrated and extracted successively with *n*-hexane, ethyl acetate and *n*-butanol. The ethyl acetate extract exhibited strongest cytotoxic activity againts P-388 murine leukemia cells. By using the cytotoxic activity to follow the separation, the ethyl acetate fraction was separated by combination of column chromatography on silica gel and preparative TLC on silica gel GF_{254} to afford a kaempferol-3-*O*-glycosides (**1**) and kaempferol-3-*O*-rhamnoside (**2**). Compound **1** and **2** showed cytotoxic activity against P-388 murine leukemia cells with IC_{50} > 100µg/mL and IC_{50} 3.32 µg / mL.

Keywords: P-388 murine leukemia cells, kaempferol-3-*O*-glycosides, Kaempferol-3-*O*-rhamnoside, *Kalanchoe tomentosa*



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1. INTRODUCTION

Kalanchoe tomentosa belongs to the family Crassulaceae is a beatiful, perennial and succulent plant. Genus *Kalanchoe* consists of about 130 species of annual and perennial shrubs. *The* plant ussually occur in semi desert of Saudia Arabia, Yemen, CentarlAfrica, Madagascar, tropical areas of Asia, Australia, and tropical America. Ussually, it is cultivated as garden ornamental and sand gardens with a medium humidity[1)].

Kalanchoe plants are used as traditional medicines to cure headache, cough, chest pain, ulcer, and other skin deseases. They overcome fever, fix the irregular menstruation, heal wound and boil, not only in Indonesia but also almost everywhere in the world[2)]. Some researches reported that *Kalanchoe* plants contain bufadienolide[3,4)], triterpenoid[5)], and flavonoid[6,7)], and biological activities like antileismanial, antiinflamatory, cytotoksic, and inhibiting tumor cell growth4). One of unknown *Kalanchoe* plants ethnopharmacologically is *Kalanchoe tomentosa*, especially its anticancer activity. Cancer is a disease that is becoming one of the major threats to health as it is the second cause of death after heart disease. In Indonesia reported increased cancer deaths each year ranging 1.4% in 1972 to 4.4% in 1992[8)]. In coping with cancer, various efforts had been whom did seek anticancer compounds from plants.