E3 Journal of Medical Research Vol. 1(4). pp. 038-043, May, 2012
Available online @ http://www.e3journals.org

Full length research paper

Antiproliferative activity of primates-consumed plants against MCF-7 human breast cancer cell lines

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Accepted 17 April, 2012

Primate-consumed plants are assumed to be a promising source of therapeutic agents since primates can survive and be cured from any disease by their daily consumed food. In the course of our study to search for anticancer agents, we evaluated 42 species of plants usually consumed by primates for their antiproliferative activity against cell lines of human breast adenocarcinoma (MCF-7). In this study, crude ethanol extracts of the plants were tested using MTT (3-(4,5-dimethylthiazolyl-2)-2,5-diphenyltetrazolium bromide) assay. The results showed that four extracts of *Dysoxylum caulostachyum, Eugenia aquea, Garcinia celebica,* and *Psychotria valentonic* leaves strongly inhibited the MCF-7 cell proliferation with IC_{50} values of 12, 58, 87, and 87 µg/ml, respectively. Further examination on the fractions of the four extracts indicated that the ethyl acetate fraction of *D. caulostachyum*, the n-hexane fractions of *E. aquea* and *G. celebica,* and the water fraction of *P. valentonic* were the most active fractions with the IC_{50} of 78 , 24, 60, and 23 µg/ml, respectively. These results suggest that primate-consumed plants might have potential as a source of anticancer agents.

Key words: Anticancer; primate; cell lines; proliferation

Introduction

Cancer known as one of the most malignant diseases worldwide (Diantini, *et al*., 2012) is characterized by uncontrolled growth and local tissue invasion with sometimes distant metastates of abnormal form of body's cells (Dashora, *et al*., 2011). Among the various cancer types, breast cancer contributes to more than 1.2 million new cases and 0.5 million mortalities annually, making it the most malignant form of cancer among women (Ferlay, *et al*., 2010). Unfortunately that currently available chemotherapeutic agents for cancer diseases including breast cancer give serious side effects and cause excessive damage to normal cells (Sakarkar and Deshmukh, 2011).

It has been known that plants have a long history of use in the treatment of cancer (Cragg and Newman, 2006), and herbal medicines have a vital role in the prevention and treatment of cancer (Sakarkar and Deshmukh, 2011). Most new clinical applications of plant secondary metabolites and their derivatives over the last half century have been applied towards combating cancer (Newman et al., 2003; Butler, 2005; Cragg and Newman, 2006).In searching for anticancer agents from plant origin, we have carried out investigations on edible plants for primates (Koshimizu *et al*., 1998). Primates are known to have very close anatomy and physiology to human; hence their diseases might be also similar. Since primates only depend on their daily consumed food, thus, primates-consumed food is assumed to contain active therapeutic compounds which can be used in human disease management, including cancer. In our previous study, we have tested 19 primate-consumed plants for their anti-tumor promoting activity and some of them have prominent activity (Koshimizu *et al*., 1998). In further investigations, we isolated kaempferol-3-*O*-rhamnoside as an active compound from leaves of *Schima walichii* Korth, a plant commonly consumed by primates, and the compound inhibits MCF-7 breast cancer cell proliferation

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