

Phytochemicals from *Mangifera pajang* Kosterm and their biological activities

ABSTRACT

Background: *Mangifera pajang* Kosterm is a plant species from the mango family (Anacardiaceae). The fruits are edible and have been reported to have high antioxidant content. However, the detailed phytochemical studies of the plant have not been reported previously. This study investigates the phytochemicals and biological activities of different parts of *Mangifera pajang*.

Methods: The plant samples were extracted with solvents of different polarity to obtain the crude extracts. The isolated compounds were characterized using spectroscopic methods. The extracts and isolated compounds were subjected to cytotoxicity tests using human breast cancer (MCF-7), human cervical cancer (HeLa) and human colon cancer (HT-29) cells. The free radical scavenging activity test was conducted using the DPPH assay. Antimicrobial activity tests were carried out by using the disc diffusion method.

Results: Phytochemical investigation on the kernel, stem bark and leaves of *Mangifera pajang* led to the isolation of methyl gallate (1), mixture of benzaldehyde (2) and benzyl alcohol (3), mangiferonic acid (4), 3 β -hydroxy-cycloart24-ene-26-oic acid (5), 3 β ,23-dihydroxy-cycloart-24-ene-26-oic acid (6), lupeol(7) lupenone(8), β -sitosterol(9), stigmasterol(10), trans-sobrerol(11) and quercitrin (12). Crude ethyl acetate and methanol extracts from the kernel indicated strong cytotoxic activity towards MCF-7 and HeLa cells with IC₅₀ values of less than 10 μ g/mL, while petroleum ether, chloroform and ethyl acetate extracts of the stem bark showed strong to moderate activity against MCF-7, HeLa and HT-29 cancer cell lines with IC₅₀ values ranging from 5 to 30 μ g/mL. As for the antimicrobial assays, only the ethyl acetate and methanol extracts from the kernel displayed some inhibition against the microbes in the antibacterial assays. The kernel extracts showed highest free radical scavenging activity with IC₅₀ values of less than 10 μ g/mL, while the ethyl acetate and methanol extracts of leaves displayed only weak activity in the DPPH assays.

Conclusions: Phytochemical investigations on various parts of *Mangifera pajang* have identified terpenoids and a flavonol derivative as major constituents. Bioassay studies have indicated that the crude extracts and isolated compounds have potential as naturally-derived anticancer and antimicrobial agents, besides possess high free radical scavenging activity.

Keyword: *Mangifera pajang*; Bambang; Phytochemicals; Cytotoxicity; DPPH; Antimicrobial