

The cytotoxicity activity of Borneo-cultivated mulberry against breast cancer cell (MCF-7): the influence of maturity stages and extraction solvents

ABSTRACT

Breast cancer is one of the leading causes of death in a part of Borneo, which is Sabah, Malaysia, and worldwide. The anticancer activity of white mulberry (*Morus alba* Linnaeus) has been widely reported. However, cultivation locations, maturity levels, and extraction solvents could influence their phytochemical and pharmacological activities. The lack of anticancer investigation has hampered the development and potential use of Borneo-grown mulberry as an anticancer agent or source. This study investigated the cell cytotoxicity activity of Malaysia-grown mulberry at two maturity stages (fruits: brackish black fully ripe and red mature; leaves: young and mature) extracted using 70% (v/v) methanol, 60% (v/v) ethanol, and 65% (v/v) acetone, against a human breast cancer cell line (MCF-7). As a result, fruits demonstrated maturity-dependent cytotoxicity decrement as the red mature fruits in 70% (v/v) methanol exerted the strongest cytotoxicity (IC₅₀ = 26.83 mg/mL). Meanwhile, the cytotoxicity of leaves revealed maturity-dependent increment as mature leaves in 60% (v/v) ethanol exhibited the strongest cytotoxicity against MCF-7 (IC₅₀ = 2.45 mg/mL). Their cytotoxicity is possibly correlated to the anticancer-possessing phenolic acids and flavonoids in fruits; and the anticancerpossessing alkaloids and terpenes in leaves. Overall, Sabah-grown mulberry possesses substantial cytotoxicity against MCF-7, suggesting its anticancer potential as a complementary treatment for breast cancer.