

The Effect of Maturity and Extraction Solvents on Bioactive Compounds and Antioxidant Activity of Mulberry (*Morus alba*) Fruits and Leaves

ABSTRACT

Cultivation location, maturity levels, and extraction solvents could affect the bioactive compounds and biological activities of mulberry (*Morus alba* Linnaeus). The lack of study on Malaysia grown mulberry causes its underutilization. This study investigated the bioactive compound content and the antioxidant activity of Sabah-grown mulberry at two different maturity stages (fruits: red mature and black fully ripe; leaves: young and mature) extracted using 70% (v/v) methanol, 60% (v/v) ethanol, and 65% (v/v) acetone. Analyses showed that mulberry fruits demonstrated maturity dependent increment (except UHPLC-DAD quantification), while the leaves revealed maturity dependent reduction. Principal component analysis (PCA) displayed 65% (v/v) acetone black fully ripe fruits as the best phenolics and antioxidant sources. However, the 60% (v/v) ethanol black fully ripe fruits contained 20.08–68.43% higher total anthocyanins. Meanwhile, the 65% (v/v) acetone and 70% (v/v) methanol red mature fruits were higher in chlorogenic acid (27.53–47.12%) and rutin (31.42–35.92%) than other fruit extracts, respectively. For leaves, 65% (v/v) acetone young leaves were the best phenolics and antioxidant sources. However, the 60% (v/v) ethanol young leaves possessed greater chlorogenic acid (19.56–74.11%) than other leaf extracts. Overall, Malaysia-grown mulberry is rich in phenolics and antioxidants, suggesting its potential application in food and pharmaceutical products.