

**EVALUASI AKTIVITAS ANTIOKSIDAN EKSTRAK METANOL DAUN
DAN KULIT BUAH MANGGA MADU (*Mangifera indica* L. “Madu”)
SECARA *IN VITRO***

ABSTRAK

Tanaman mangga madu (*Mangifera indica* L. “Madu”) berpotensi sebagai sumber biofarmaka alami karena mengandung senyawa aktif dengan aktivitas antioksidan. Daun dan kulit buah mangga madu memiliki kandungan metabolit sekunder antara lain alkaloid, fenolik, flavonoid, steroid dan steroid. Fenolik dan flavonoid merupakan metabolit sekunder yang berperan dalam aktivitas antioksidan. Antioksidan berperan penting dalam mencegah kerusakan sel akibat radikal bebas yang dapat memicu penyakit degeneratif. Berdasarkan hal tersebut maka penelitian ini dilakukan untuk mengetahui kadar fenolik dan flavonoid total serta mengevaluasi aktivitas antioksidan ekstrak metanol daun dan kulit buah mangga madu secara *In Vitro* menggunakan metode DPPH, ABTS, dan FRAP. Proses ekstraksi dilakukan dengan metode maserasi menggunakan pelarut metanol, selama tiga hari dengan suhu ruangan. Aktivitas antioksidan dianalisis secara spektrofotometri UV-Vis. Temuan ini menunjukkan bahwa tanaman mangga madu berpotensi dikembangkan sebagai sumber antioksidan biofarmaka. Hasil penelitian menunjukkan bahwa ekstrak daun memiliki kadar fenolik total sebesar (255,627 mg GAE/g) dan flavonoid (43,326 mg QE/g) yang jauh lebih tinggi dibanding kulit buah mangga madu (fenolik 25,777 mg GAE/g dan flavonoid (15,632 mg QE/g). Aktivitas antioksidan ekstrak metanol daun juga lebih kuat dengan IC_{50} DPPH 0,457 ppm, IC_{50} ABTS 5,430 ppm, dan nilai FRAP 410,356 $\mu\text{mol Fe}^{2+}/\text{g}$. Perbedaan kadar fenolik, flavonoid dan aktivitas antioksidan antara daun dan kulit buah mangga madu dipengaruhi oleh variasi metabolisme sekunder tiap bagian tanaman berbeda. Daun sebagai organ fotosintesis yang terpapar sinar matahari dan stres lingkungan sehingga menghasilkan fenolik dan flavonoid lebih tinggi sebagai pertahanan antioksidan sementara pada kulit buah lebih berfungsi sebagai pelindung fisik buah sehingga kandungan metabolisme sekundernya lebih rendah. Daun mangga madu lebih potensial sebagai sumber antioksidan alami dibanding kulit buah mangga madu, sehingga cocok dikembangkan untuk obat herbal dalam pencegahan penyakit degeneratif.

Kata kunci: *Aktivitas_antioksidan, Ekstrak_ metanol, Fitokimia, Mangifera indica, Mangga madu, Radikal bebas.*

**Evaluation of Antioxidant Activity
of Methanol Extracts of Leaves and Fruit Peel of Madu Mango
(*Mangifera indica* L. “Madu”) *In Vitro***

ABSTRACT

*The honey mango plant (*Mangifera indica* L. "Madu") has the potential to be a source of natural biopharmaceuticals because it contains active compounds with antioxidant activity. The leaves and skin of honey mango fruit contain secondary metabolites, including alkaloids, phenolics, flavonoids, steroids, and terpenoids. Phenolics and flavonoids are secondary metabolites that play a role in antioxidant activity. Antioxidants play an important role in preventing cell damage caused by free radicals, which can trigger degenerative diseases. Based on this, this research was conducted to determine the total phenolic and flavonoid content and evaluate the antioxidant activity of methanol extracts from honey mango leaves and fruit peel in vitro using the DPPH, ABTS, and FRAP methods. The extraction process was carried out using the maceration method with methanol solvent for three days at room temperature. Antioxidant activity was analyzed using UV-Vis's spectrophotometry. The findings indicate that honey mango plants have the potential to be developed as a source of biopharmaceutical antioxidants. The research results indicate that the leaf extract has a total phenolic content of 255.627 mg GAE/g and flavonoids of 43.326 mg QE/g, which is significantly higher than that of honey mango fruit peel (phenolics 25.777 mg GAE/g and flavonoids 15.632 mg QE/g). The antioxidant activity of the methanol leaf extract was also stronger, with an IC₅₀ for DPPH of 0.457 ppm, an IC₅₀ for ABTS of 5.430 ppm, and a FRAP value of 410.356 $\mu\text{mol Fe}^{2+}/\text{g}$. Differences in phenolic and flavonoid content and antioxidant activity between the leaves and fruit peel of honey mango are influenced by variations in secondary metabolism in each part of the plant. Leaves, as photosynthetic organs exposed to sunlight and environmental stress, produce higher levels of phenolic and flavonoid compounds as antioxidant defences, while the fruit peel primarily serves as physical protection, resulting in lower secondary metabolite content. Honey mango leaves are more potent as a source of natural antioxidants than honey mango fruit peel, making them suitable for development as herbal medicine in the prevention of degenerative diseases.*

Keywords: Antioxidant activity, methanol extract, phytochemicals, *Mangifera indica*, honey mango, free radicals.