

# PENGARUH DAUN MUDA DAN DAUN TUA TERHADAP KADAR TOTAL ALKALOID DAN FENOLIK DAUN TEH HIJAU (*Camellia sinensis* L.)

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## INTISARI

**Latar Belakang:** Daun teh hijau mengandung berbagai senyawa metabolit sekunder, seperti alkaloid (kafein) dan senyawa fenolik (katekin, flavonoid, asam fenolat), yang berperan sebagai antioksidan dan berpotensi mencegah penyakit degeneratif. Kandungan metabolit sekunder pada daun teh dipengaruhi oleh tingkat kematangan daun. Daun muda umumnya memiliki kadar alkaloid dan flavonoid lebih tinggi dibandingkan daun tua, sedangkan penuaan daun menyebabkan penurunan kadar air dan fenolik total. Hal ini menunjukkan bahwa tingkat kematangan daun berperan penting dalam menentukan kadar senyawa bioaktif.

**Tujuan Penelitian:** Mengetahui pengaruh tingkat kematangan daun terhadap kadar total alkaloid dan fenolik daun teh hijau (*Camellia sinensis* L.).

**Metode Penelitian:** Serbuk daun teh hijau muda dan tua diekstraksi dengan etanol 70% (1:100) metode yang digunakan *Ultrasound-Assited Extraction* (UAE) dengan suhu 50°C selama 30 menit. Fitrat diuapkan dengan suhu 40°C. Hasil ekstraksi kemudian dilakukan uji organoleptis, skrining fitokimia, identifikasi senyawa alkaloid dan fenolik dengan KLT, serta kadar total alkaloid dinyatakan dalam (mgCE/g) sedangkan kadar total fenolik dinyatakan dalam (mgGAE/g).

**Hasil Penelitian :** Hasil ekstrak kental daun teh hijau muda dan tua yang diperoleh berwarna coklat kehitaman, berbentuk kental, dan tidak berbau. Hasil skrining fitokimia menunjukkan positif alkaloid, fenolik, flavonoid, saponin dan tannin. Kadar alkaloid total daun teh hijau muda sebesar  $925,113 \pm 2,021$  mg CE/g sedangkan kadar fenolik total sebesar  $176,425 \pm 0,25$  mg GAE/g. Kadar alkaloid total daun teh hijau tua sebesar  $482,395 \pm 1,483$  mg CE /g sedangkan kadar fenolik total sebesar  $97,842 \pm 0,382$  mg GAE/g.

**Kesimpulan :** Tingkat kematangan daun berpengaruh signifikan terhadap kadar total alkaloid dan fenolik daun teh hijau. Daun teh hijau muda menghasilkan kadar total alkaloid dan fenolik paling optimal.

**Kata Kunci:** Daun teh hijau, *Camellia sinensis* L, Daun muda, Daun tua, Alkaloid, Fenolik, *Ultrasound-Assited Extraction* (UAE).

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# THE EFFECT OF YOUNG AND OLD LEAVES ON THE TOTAL ALKALOID AND PHENOLIC LEVELS OF GREEN TEA LEAVES (*Camellia sinensis* L.)

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## ABSTRACT

**Background:** Green tea leaves contain various secondary metabolites, such as alkaloids (caffeine) and phenolic compounds (catechins, flavonoids, phenolic acids), which act as antioxidants and have the potential to prevent degenerative diseases. The content of secondary metabolites in tea leaves is influenced by the degree of leaf maturity. Young leaves generally have higher levels of alkaloids and flavonoids than older leaves, while leaf aging causes a decrease in water and total phenolic content. This suggests that the degree of leaf maturity plays a significant role in determining the levels of bioactive compounds.

**Objective:** To determine the effect of leaf maturity level on the total alkaloid and phenolic content of green tea leaves (*Camellia sinensis* L.).

**Research Method:** Young and old green tea leaf powder was extracted with 70% ethanol (1:100) using the Ultrasound-Assisted Extraction (UAE) method at 50°C for 30 minutes. The filtrate was evaporated at 40°C. The extraction results were then subjected to organoleptic tests, phytochemical screening, identification of alkaloid and phenolic compounds by TLC, and the total alkaloid content was expressed in (mgCE/g) while the total phenolic content was expressed in (mgGAE/g).

**Research Results:** The thick extract of young and old green tea leaves obtained was blackish brown, thick, and odorless. The results of phytochemical screening showed positive alkaloids, phenolics, flavonoids, saponins and tannins. The total alkaloid content of young green tea leaves was  $925.113 \pm 2.021$  mg CE / g while the total phenolic content was  $176.425 \pm 0.25$  mg GAE / g. The total alkaloid content of old green tea leaves was  $482.395 \pm 1.483$  mg CE / g while the total phenolic content was  $97.842 \pm 0.382$  mg GAE / g.

**Conclusion:** The degree of leaf maturity significantly influences the total alkaloid and phenolic content of green tea leaves. Young green tea leaves produce the most optimal total alkaloid and phenolic content.

**Keywords:** *Camellia sinensis* L, Young leaves, Old leaves, Alkaloids, Phenolics, Ultrasound-Assisted Extraction (UAE).

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