

**EFEKTIVITAS IRADIASI UV-C TERHADAP PENURUNAN KADAR PESTISIDA  
DELTAMETRIN PADA SEDUHAN TEH HIJAU DAN TEH HITAM**  
*Camellia sinensis*

**SKRIPSI**

Diajukan untuk Memenuhi Salah Satu Persyaratan Memperoleh Gelar Sarjana Sains  
Program Studi Kimia



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Sebuah skripsi yang diajukan untuk memenuhi salah satu syarat  
memperoleh gelar Sarjana Sains pada Fakultas Pendidikan  
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## PERNYATAAN

Dengan ini saya menyatakan bahwa skripsi dengan judul “**Efektivitas Iradiasi UV-C Terhadap Penurunan Kadar Pestisida Deltametrin pada Seduhan Teh Hijau dan Teh Hitam *Camellia sinensis***” beserta seluruh isinya adalah benar-benar karya saya sendiri. Saya tidak melakukan pengutipan atau penjiplakan dengan cara-cara yang tidak sesuai dengan etika keilmuan yang berlaku dalam masyarakat keilmuan. Atas pernyataan ini, saya siap menerima risiko atau sanksi apabila kemudian hari ditemukan adanya pelanggaran etika keilmuan atau ada klaim dari pihak lain terhadap keaslian karya saya.

Bandung, Agustus 2024

Yang membuat pernyataan,



Arwa Haiatul Isni

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## ABSTRAK

Tanaman teh (*Camellia sinensis*) merupakan tanaman yang rentan terhadap berbagai penyakit, gulma, dan hama, sehingga membutuhkan pestisida untuk mencegahnya, salah satunya adalah deltametrin. Penelitian sebelumnya menunjukkan adanya residu deltametrin dalam berbagai produk seduhan teh yang ditenggarai dapat menimbulkan beberapa gejala klinis. Fotodegradasi dengan sinar UV-C diketahui dapat menjadi solusi untuk mendegradasi deltametrin. Penelitian ini bertujuan untuk mengetahui efektivitas iradiasi UV-C terhadap penurunan kadar pestisida deltametrin pada dua jenis seduhan teh, yaitu teh hijau dan teh hitam serta mengetahui pengaruh waktu iradiasi UV-C terhadap penurunan kadar deltametrin. Analisis dilakukan dengan menambahkan 100 ppm pestisida deltametrin pada setiap jenis seduhan teh dan dilakukan iradiasi dengan sinar UV-C pada variasi waktu selama 15, 30, dan 45 menit. Hasil iradiasi diekstraksi dengan ekstraksi cair-cair menggunakan etil asetat serta ekstraksi fasa padat dengan menggunakan QuEChERS. Penurunan kadar deltametrin dalam teh hijau dan teh hitam hasil iradiasi UV-C diukur secara kuantitatif menggunakan *Gas Chromatography Flame Ionization Detector*. Hasil penelitian menunjukkan bahwa perbedaan matriks dalam teh hijau dan teh hitam memengaruhi penurunan kadar deltametrin dengan penurunan tertinggi pada teh hijau. Hasil dari variasi waktu yang digunakan didapatkan hasil penurunan persentase degradasi tertinggi pada waktu 45 menit untuk teh hijau sebesar  $85,12 \pm 2,25$  % dan pada teh hitam sebesar  $63,25 \pm 2,08$  %.

**Kata Kunci:** Deltametrin, Fotodegradasi, Iradiasi UV-C, Teh *Camellia sinensis*.

### **ABSTRACT**

*Tea plant (Camellia sinensis) is a plant that is susceptible to various diseases, weeds and pests, so it requires pesticides to prevent them, one of which is deltamethrin. Previous research has shown that the presence of deltamethrin residues in various tea brewing products is suspected to cause several clinical symptoms. Photodegradation with UV-C light is known to be a solution for degrading deltamethrin. This study aims to determine the effectiveness of UV-C irradiation in reducing deltamethrin pesticide levels in two types of tea brew, namely green tea and black tea and to determine the effect of UV-C irradiation time on reducing deltamethrin levels. Analysis was carried out by adding 100 ppm of deltamethrin pesticide to each type of tea brew and irradiation with UV-C light at varying times of 15, 30 and 45 minutes. The irradiation results were extracted by liquid-liquid extraction using ethyl acetate and solid phase extraction using QuEChERS. The decrease in deltamethrin levels in green tea and black tea resulting from UV-C irradiation was measured quantitatively using Gas Chromatography Flame Ionization Detector. The results showed that the difference in matrix in green tea and black tea influenced the reduction in deltamethrin levels with the highest reduction in green tea. The results of varying the time used showed that the highest degradation was at 45 minutes with the percentage reduction was  $85.12 \pm 2.25\%$  for green tea and  $63.25 \pm 2.08\%$  for black tea.*

**Keywords:** *Deltamethrin, Photodegradation, UV-C Irradiation, Tea Camellia sinensis.*



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