

**PENGARUH TEKNIK IRADIASI UV-C TERHADAP  
PENURUNAN KADAR PESTISIDA BUPROFEZIN  
PADA BEBERAPA JENIS SEDUHAN TEH (*Camellia sinensis*)**

**SKRIPSI**

Diajukan untuk memenuhi salah satu syarat untuk memperoleh  
gelar Sarjana Sains pada Program Studi Kimia



oleh

Dewi Yulina Nur Soleha

NIM 1900598

**KELOMPOK BIDANG KAJIAN MAKANAN  
PROGRAM STUDI KIMIA  
FAKULTAS PENDIDIKAN MATEMATIKA DAN ILMU PENGETAHUAN ALAM  
UNIVERSITAS PENDIDIKAN INDONESIA  
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**Oleh:**

**Dewi Yulina Nur Soleha**

**Sebuah skripsi yang diajukan untuk memenuhi salah satu syarat untuk memperoleh  
gelar Sarjana Sains (S.Si) pada Program Studi Kimia di  
Fakultas Pendidikan Matematika dan Ilmu Pengetahuan Alam Universitas Pendidikan Indonesia**

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**Agustus 2023**

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**LEMBAR PENGESAHAN**

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Oleh:

Dewi Yulina Nur Soleha

NIM: 1900598

Disetujui oleh,

Pembimbing I,



Dra. Hj. Zackiyah, M.Si.

NIP. 195912291991012001

Pembimbing II,

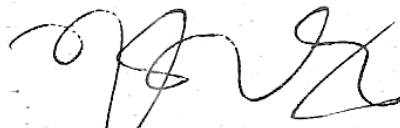


Drs. Ali Kusrijadi, M.Si.

NIP. 196706291992031001

Mengetahui,

Ketua Program Studi Kimia FPMIPA UPI



Prof. Fitri Khoerunnisa, Ph.D.

NIP. 197806282001122001

## PERNYATAAN

Dengan ini saya menyatakan bahwa skripsi dengan judul **“Pengaruh Teknik Iradiasi UV-C terhadap Penurunan Kadar Pestisida Buprofezin pada Beberapa Jenis Seduhan Teh (*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 2023

Yang membuat pernyataan,



Dewi Yulina Nur Soleha

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## ABSTRAK

Buprofezin merupakan pestisida yang banyak digunakan untuk mengurangi hama tanaman teh. Penelitian sebelumnya menunjukkan bahwa residu buprofezin ditemukan dalam seduhan teh. Keberadaan residu buprofezin dapat berbahaya bagi kesehatan. Penelitian ini bertujuan mengkaji penurunan kadar buprofezin, aktivitas antioksidan dalam ketiga jenis seduhan teh (putih, hijau, dan hitam) dan konfirmasi hasil fotodegradasi buprofezin pada seduhan teh hijau akibat iradiasi UV-C. Penurunan residu buprofezin dalam berbagai sampel teh dan konfirmasi produk fotodegradasi dianalisis menggunakan instrumen LC-MS/MS *Triple Quadrupole* sedangkan penurunan aktivitas antioksidan menggunakan 2,2-difenil-1-pikrilhidrazil (DPPH). Hasil penelitian menunjukkan bahwa teknik iradiasi UV-C dapat menurunkan kadar buprofezin pada ketiga jenis seduhan teh tetapi tidak signifikan, yaitu 29,27% pada teh putih, 29,30% pada teh hijau, dan 31,81% pada teh hitam. Hasil penelitian juga menunjukkan bahwa iradiasi UV-C menurunkan aktivitas antioksidan pada ketiga jenis seduhan teh, dengan penurunan aktivitas antioksidan paling tinggi ada pada teh putih (15,11%), teh hijau (7,63%), dan paling rendah teh hitam (6,70%). Terkonfirmasi tiga produk senyawa hasil fotodegradasi buprofezin pada jenis seduhan teh hijau yaitu 1-(ters-butil)-3-isopropiltiourea, 1-(ters-butil)-3-metilkarbamoil-isopropiltiourea dan 1-isopropil-3-fenilurea. Hasil ini mengkonfirmasi bahwa kandungan senyawa dalam ketiga jenis teh dikonfirmasi dari aktivitas antioksidan yang menurun menunjukkan efek penghambatan degradasi buprofezin, dengan kemampuan penghambatan degradasi buprofezin tertinggi ada pada jenis teh putih.

**Kata kunci:** aktivitas antioksidan, buprofezin, fotodegradasi, jenis teh, LC-MS/MS

## **ABSTRACT**

Buprofezin is a pesticide that is widely used to reduce tea plant pests. Previous studies have shown that buprofezin residues are found in tea infusion. The presence of buprofezin residues can be hazardous to health. This study aims to examine the decrease in buprofezin levels, antioxidant activity in the three types of tea infusions (white, green and black) and to confirm the results of photodegradation of buprofezin in infusions of green tea due to UV-C irradiation. The reduction of buprofezin residues in various tea samples and confirmation of product photodegradation were analyzed using the LC-MS/MS Triple Quadrupole instrument while the decrease in antioxidant activity used 2,2-diphenyl-1-picrylhydrazyl (DPPH). The results showed that the UV-C irradiation technique reduced buprofezin levels in the three types of tea infusion but not significantly, namely 29.27% for white tea, 29.30% for green tea, and 31.81% for black tea. The research results also showed that UV-C irradiation reduced antioxidant activity in the three types of tea infusion, with the highest reduction in antioxidant activity in white tea (15.11%), green tea (7.63%), and the lowest in black tea (6.70%). It was confirmed that 3 products resulted from the photodegradation of buprofezin in green tea infusion, namely 1-(tert-butyl)-3-isopropylthiourea, 1-(tert-butyl)-3-methylcarbamoyl-isopropylthiourea and 1-isopropyl-3-phenylurea. These results confirm that the compound content in the three types of tea is confirmed by the decreased antioxidant activity showing an inhibitory effect on buprofezin degradation, with the highest ability to inhibit buprofezin degradation in the white tea type.

**Keywords:** antioxidant activity, buprofezin, photodegradation, tea matrix, LC-MS/MS



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Dewi Yulina Nur Soleha, 2023

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