

**PENGARUH PAPAN OBAT ANTINYAMUK AEROSOL TERHADAP  
PERUBAHAN GAMBARAN HISTOPATOLOGI KORTEKS SEREBRUM  
OTAK TIKUS WISTAR (*Rattus novergicus*)**



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**THE EFFECT OF MOSQUITO REPELLENT AEROSOL EXPOSURE TO HISTOPATHOLOGICAL CHANGES IN THE CEREBRAL CORTEX OF RAT CENTRAL NERVOUS SYSTEM (*Rattus novergicus*) - An Experimental Study**

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**ABSTRACT**

Mosquito repellent aerosol containing pyrethroid that can induce oxidative stress. Oxidative stress causes nerve cell damage. This research aimed to prove the effect of mosquito repellent aerosol exposure to histopathological changes in the cerebral cortex of rat central nervous system (*Rattus novergicus*).

An experimental study with randomized pre test-post test control group design was conducted on 20 rat divided equally into four groups. Each group has different treatment for day 1 until day 42: The control group was not given a mosquito repellent aerosol exposure, whereas in the group I, II, III treated by exposure to a mosquito repellent aerosol for 1 hour in a box with a volume of 0.167 m<sup>3</sup> (0.405 m x 0.800 m x 0.515 m). Mosquito repellent given is as much as 1 mL (treatment 1), 2 mL (treatment 2) and 3 mL (treatment 3). After 6 weeks of treatment, piknotik cells and lymphocytes in the rat cerebral cortex histopathology counted under microscope. One Way ANOVA and LSD post hoc test were used to analyze the data. A P-value less than 0.05 considered significant.

The result showed that there was an increase in mean percentage of piknotik cells in the treatment groups compared to control group (Treatment 3: 85.00±1.93; Treatment 2: 72.20±2.40; Treatment 1: 5.67±1.37 vs Control : 39.00±1.87),  $p = 0.014$  ( $p < 0.05$ ) and there was an increase in mean percentage of Lymphocytes in the treatment groups compared to control group (Treatment 3: 70.40±2.40; Treatment 2: 51.00±1.17; Treatment 1: 47.80±1.20 vs Control : 31.80±1.63, nilai  $p = 0.019$  ( $p < 0.05$ )).

The histological feature in the cerebral cortex of rat central nervous system was changed after exposure to pyrethroid from repellent aerosol by increasing picnotic cell and lymphocytes.

Keywords: insect repellent, pyrethroids, aerosols, oxidative stress, cerebral cortex, piknotik, lymphocytes

# PENGARUH PAPARAN OBAT ANTINYAMUK AEROSOL TERHADAP PERUBAHAN GAMBARAN HISTOPATOLOGI KORTEKS SEREBRUM OTAK TIKUS WISTAR (*Rattus novergicus*)

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## ABSTRAK

Penggunaan Obat antinyamuk aerosol sangat banyak di masyarakat. Obat antinyamuk aerosol yang mengandung piretroid bisa menginduksi stres oksidatif. Stres oksidatif menyebabkan terjadinya kerusakan pada sel saraf. Tujuan penelitian ini adalah untuk mengetahui pengaruh paparan obat antinyamuk aerosol terhadap gambaran histopatologi korteks serebrum otak tikus wistar (*Rattus novergicus*).

Penelitian *randomized post test only control group design* dilakukan pada 20 ekor tikus Wistar (*Rattus novergicus*) jantan yang dibagi menjadi empat kelompok. Terhadap kelompok kontrol tidak diberi paparan obat antinyamuk aerosol, sedangkan pada kelompok perlakuan diberi paparan obat antinyamuk aerosol selama 1 jam dalam kotak dengan volume 0,167 m<sup>3</sup> (0,405 m x 0,800 m x 0,515 m). Obat antinyamuk yang diberikan adalah sebanyak 1 mL, 2 mL dan 3 mL. Setelah 6 minggu perlakuan, sel dengan inti piknotik dan sel limfosit pada histopatologi korteks serebrum tikus dihitung dibawah mikroskop. Analisis data secara komputasi dengan uji *One Way ANOVA* dan *LSD post hoc test*.

Hasil penelitian menunjukkan rerata persentase sel dengan inti piknotik kelompok perlakuan lebih tinggi dibandingkan dengan kontrol (P3: 85.00±1.93; P2: 72.20±2.40; P1: 5.67±1.37 vs K : 39.00±1.87, nilai p = 0.014 (p< 0.05) dan rerata persentase sel limfosit kelompok perlakuan juga lebih tinggi dibandingkan dengan kontrol (P3: 70.40±2.40; P2: 51.00±1.17; P1: 47.80±1.20 vs K : 31.80±1.63, nilai p = 0.019 (p< 0.05).

Penelitian ini menyimpulkan obat antinyamuk aerosol yang mengandung piretroid memiliki pengaruh terhadap perubahan gambaran histopatologi korteks serebrum otak tikus wistar (*Rattus novergicus*) berupa peningkatan jumlah sel dengan inti piknotik dan sel limfosit.

Kata Kunci : obat nyamuk, piretroid, aerosol, stres oksidatif, kerusakan korteks serebrum, inti piknotik, limfosit