

**PENGARUH EKSTRAK PEGAGAN (*Centella asiatica*) TERHADAP
FUNGSI KOGNITIF TIKUS PUTIH (*Rattus norvegicus*) YANG
DIBERI PAPARAN GELOMBANG ELEKTROMAGNETIK
TELEPON SELULER**

ABSTRAK

Latar Belakang – Paparan gelombang elektromagnetik telepon seluler dapat menyebabkan stres oksidatif dan gangguan fungsi kognitif. Pegagan (*Centella asiatica*) memiliki aktivitas antioksidan dan neuroprotektif yang berpotensi mencegah kerusakan sel saraf akibat paparan gelombang elektromagnetik.

Tujuan – Mengetahui pengaruh ekstrak pegagan terhadap fungsi kognitif tikus putih (*Rattus norvegicus*) yang diberikan paparan gelombang elektromagnetik telepon seluler.

Metode – Penelitian eksperimental dengan rancangan *true experimental randomized post-test only controlled group design* pada 30 ekor tikus Wistar jantan yang dibagi menjadi lima kelompok, yaitu kontrol, paparan gelombang elektromagnetik tanpa ekstrak pegagan, serta paparan gelombang elektromagnetik dengan ekstrak pegagan dosis 125, 250, dan 500 mg/kgBB selama 45 hari. Paparan diberikan 2 jam/hari pada frekuensi 2100 MHz. Fungsi kognitif diukur menggunakan uji *Y-Maze spontaneous alternation*. Analisis data dilakukan dengan *One-way ANOVA* dan *post hoc Tukey HSD*.

Hasil – Rerata alternasi spontan tertinggi terdapat pada kelompok kontrol (75,48%), diikuti kelompok dengan pemberian pegagan dosis 500 mg/kgBB (61,55%), 250 mg/kgBB (55,68%), dan 125 mg/kgBB (54,52%), sedangkan rerata terendah terdapat pada kelompok tanpa pegagan (47,18%). Uji *One-way ANOVA* menunjukkan perbedaan signifikan fungsi kognitif antar kelompok ($p=0,022$). Analisis *post hoc Tukey HSD* menunjukkan perbedaan bermakna hanya antara kelompok kontrol dan kelompok tanpa pegagan ($p=0,013$), sementara kelompok yang mendapat pegagan menunjukkan rerata alternasi spontan lebih tinggi, dengan nilai tertinggi pada dosis 500 mg/kgBB, tetapi belum mencapai signifikansi statistik.

Kesimpulan – Paparan gelombang elektromagnetik memengaruhi fungsi kognitif tikus putih. Ekstrak pegagan belum menunjukkan pengaruh signifikan, tetapi terdapat kecenderungan perbaikan fungsi kognitif seiring peningkatan dosis.

Kata kunci: *Centella asiatica*, gelombang elektromagnetik, fungsi kognitif, *Y-Maze*, tikus Wistar.

**THE EFFECT OF GOTU KOLA (*Centella Asiatica*) EXTRACT ON
THE COGNITIVE FUNCTION OF WHITE RATS (*Rattus
Norvegicus*) EXPOSED TO MOBILE PHONE
ELECTROMAGNETIC WAVES**

ABSTRACT

Background – Exposure to mobile phone electromagnetic waves can induce oxidative stress and impair cognitive function. *Centella asiatica* has antioxidant and neuroprotective properties that may reduce neuronal damage caused by electromagnetic wave exposure.

Objective – To determine the effect of *Centella asiatica* extract on cognitive function in white rats (*Rattus norvegicus*) exposed to mobile phone electromagnetic waves.

Methods – This experimental study used a true experimental randomized post-test only controlled group design involving 30 male Wistar rats divided into five groups: control, electromagnetic wave exposure without *Centella asiatica* extract, and exposure with *Centella asiatica* extract at doses of 125, 250, and 500 mg/kgBW for 45 days. Exposure was administered for 2 hours/day at 2100 MHz. Cognitive function was assessed using the Y-Maze spontaneous alternation test. Data were analyzed using One-way ANOVA followed by the Tukey HSD *post hoc* test.

Results – The highest mean spontaneous alternation was observed in the control group (75.48%), followed by groups receiving *Centella asiatica* at doses of 500 mg/kgBW (61.55%), 250 mg/kgBW (55.68%), and 125 mg/kgBW (54.52%). The lowest mean was found in the group without *Centella asiatica* (47.18%). One-way ANOVA showed a significant difference among groups ($p=0.022$). Tukey HSD *post hoc* analysis revealed a significant difference only between the control group and the group without *Centella asiatica* ($p=0.013$). Groups receiving *Centella asiatica* showed higher mean values, with the highest at 500 mg/kgBW, but were not statistically significant.

Conclusion – Electromagnetic wave exposure affects cognitive function in white rats. *Centella asiatica* extract did not show a significant effect; however, a dose-related trend toward improved cognitive function was observed.

Keywords : *Centella asiatica*, electromagnetic waves, cognitive function, Y-Maze, Wistar rats.