

**PENGARUH PEMBERIAN KRIM KUERSETIN TERHADAP JUMLAH MELANIN  
PADA KULIT MARMOT (*C.porcellus*) YANG TERPAPAR  
SINAR ULTRAVIOLET B**

**TESIS**

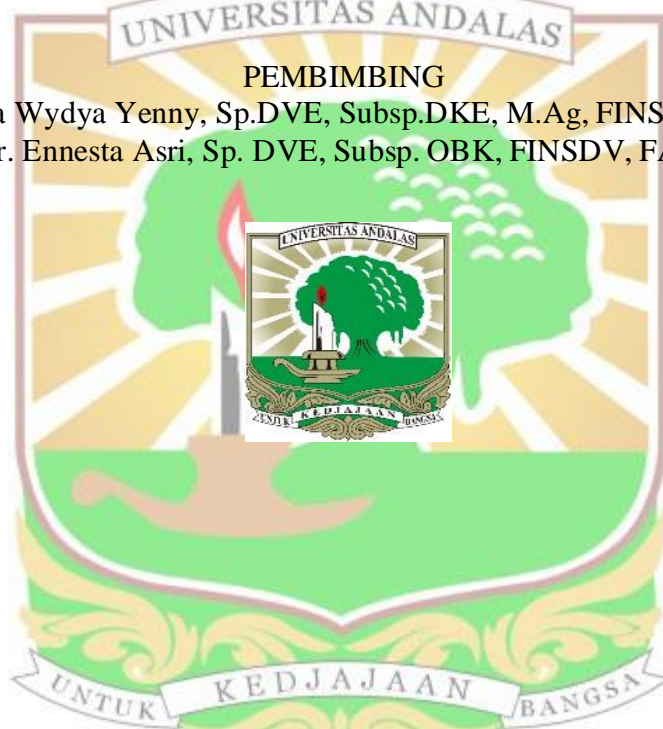
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# PENGARUH PEMBERIAN KRIM KUERSETIN TERHADAP JUMLAH MELANIN PADA KULIT MARMOT(*C.porcellus*) YANG TERPAPAR SINAR ULTRAVIOLET B

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## Abstrak

### Latar Belakang

Efektivitas kuersetin sebagai flavonoid hingga saat ini masih terus dieksplorasi. Kuersetin diketahui menghambat aktivitas enzim tirosinase dan proses melanogenesis secara *in vitro*. Penelusuran dosis efektif dan pengaruh kuersetin secara topikal terhadap jumlah melanin perlu dilakukan secara *in vivo*.

### Tujuan

Mengetahui pengaruh pemberian krim kuersetin terhadap jumlah melanin pada kulit marmot yang terpapar sinar ultraviolet B.

### Subjek dan Metode

Penelitian ini merupakan penelitian eksperimental dengan metode *post-test only control group design*. Subjek penelitian terdiri dari 25 ekor marmot (*C.Porcellus*) yang dibagi menjadi 5 kelompok. Setiap kelompok diberi pajanan sinar UVB 3 kali seminggu selama 2 minggu dengan dosis total 390 mJ/cm<sup>2</sup>. Kelompok (P0) diberi krim DMSO, kelompok (P1) diberi krim hidrokuinon 4%, kelompok (P2) diberi krim kuersetin 2%, kelompok (P3) diberi krim kuersetin 4% dan kelompok (P4) diberikan krim kuersetin 6%. Krim diberikan 2 kali sehari sebelum pajanan sinar UVB dan setelah pajanan sinar UVB selama 2 minggu. Jaringan kulit di biopsi dan dilakukan pemeriksaan histopatologi dengan metode imunohistokimia dengan *Masson-Fontana stain*. Jumlah melanin dihitung dengan persentase *pixel* luas area melanin dibandingkan dengan *pixel* seluruh jaringan epidermis menggunakan *software analysis ImageJ*.

### Hasil

Hasil penelitian menunjukkan rerata jumlah melanin paling tinggi terdapat pada kelompok krim kontrol (P0) sebesar 19,27% sedangkan jumlah melanin paling rendah didapat pada kelompok krim hidrokuinon 4% (P1) sebesar 6,36%. Temuan pada kelompok uji krim kuersetin 2% (P2) sebesar 18,35%, kelompok krim kuersetin 4% (P3) sebesar 16,98%, dan kelompok krim kuersetin 6% (P4) sebesar 13,36%. Terdapat perbedaan bermakna antar kelompok dengan ANOVA  $p < 0,001$ . Hasil analisis lebih lanjut dengan *post hoc* menunjukkan kelompok kuersetin 6% (P4) berbeda bermakna dengan kelompok kontrol (P0) dengan  $p < 0,001$ .

### Kesimpulan

Terdapat pengaruh pemberian krim kuersetin 6% terhadap penurunan jumlah melanin pada kulit marmot yang terpapar sinar ultraviolet B.

**Kata kunci:** kuersetin, melanin, melanogenesis

**THE EFFECT OF QUERCETIN CREAM APPLICATION ON THE  
MELANIN CONTENT IN THE SKIN OF GUINEA PIGS  
(*C. porcellus*) EXPOSED TO ULTRAVIOLET B RAYS.**

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**Abstract**

**Background**

Quercetin is known to inhibit tyrosinase activity and the melanogenesis process in vitro. Determining the effective dose and the impact of topical quercetin on melanin levels must be conducted in vivo.

**Objective**

Understanding the effect of quercetin cream application on the melanin content in the skin of guinea pigs exposed to ultraviolet B rays.

**Subject and Method**

This study is an experimental study using a post-test only control group design method. The research subjects consisted of 25 guinea pigs (*Cavia porcellus*) divided into 5 groups. Each group was exposed to UVB light 3 times a week for 2 weeks with a total dose of 390 mJ/cm<sup>2</sup>. Group P0 were given DMSO cream, group P1 given 4% hydroquinone cream, group P2 with 2% quercetin cream, Group P3 given 4% quercetin cream, group P4 Given 6% quercetin cream. The cream was applied twice daily before and after UVB exposure for 2 weeks. Skin biopsies were taken, and histopathological examinations were conducted using immunohistochemical methods with Fontana-Masson stain. Melanin content was quantified by comparing the pixel percentage of melanin area to the total epidermal area using ImageJ analysis software.

**Result**

The study results showed that the highest average melanin content was found in the control cream group (P0) at 19.27%. The lowest melanin content was observed in the 4% hydroquinone cream group (P1) at 6.36%. The melanin content in the 2% quercetin cream group (P2) was 18.35%, in the 4% quercetin cream group (P3) it was 16.98%, and in the 6% quercetin cream group (P4) it was 13.36%. There were significant differences between the groups, as indicated by ANOVA ( $p < 0.001$ ). Further post hoc analysis showed that the 6% quercetin group (P4) was significantly different from the control group (P0) with  $p < 0.001$ .

**Conclusion**

There is an effect of quercetin cream application on the reduction of melanin content in the skin of guinea pigs exposed to ultraviolet B rays.

**Keywords:** quercetin, melanin, melanogenesis