

PENGARUH EKSTRAK LENDIR BEKICOT *Achatina fulica* PADA KULIT MENCIT MODEL *SUNBURN* YANG DIINDUKSI OLEH RADIASI SINAR ULTRAVIOLET A DAN B

ABSTRAK

Latar belakang. *Sunburn* merupakan inflamasi akut yang disebabkan oleh radiasi sinar UV, ditandai dengan terjadinya eritema, nyeri dan edema pada kulit. Penatalaksanaan *sunburn* tidak lagi berorientasi pada pengobatan tetapi lebih ke arah pencegahan salah satunya dengan tabir surya. Lendir bekicot *Achatina fulica* (*A. fulica*) saat ini menjadi salah satu bahan aktif yang populer dalam perawatan kulit, namun potensinya sebagai fotoprotektor maupun anti-inflamasi terhadap paparan radiasi sinar UV belum banyak diteliti.

Tujuan. Penelitian ini bertujuan meneliti kandungan antioksidan enzimatik dan non-enzimatik pada lendir bekicot *A. fulica*, peranannya sebagai fotoprotektor dan anti-inflamasi.

Metode. Penelitian ini merupakan penelitian eksperimental dengan *post test only-control group design* dengan menggunakan 75 menit *Mus musculus BALB/c* dalam 15 kelompok. Lendir bekicot dibuat solusi dalam beberapa dosis 20%, 50%, 70% dan 100% yang dioleskan 1 jam sebelum radiasi sinar UVA maupun UVB. Efek fotoprotektor dilakukan dengan menilai kadar enzim antioksidan SOD, CAT dan GPX pada paparan radiasi sinar UV dan dengan pemeriksaan histopatologis yang dilakukan secara semikuantitatif dengan pengamatan perubahan pada kulit mencit berupa pembentukan *sunburn cells*, krusta, ulserasi dan inflamasi dermal dengan sistem skoring. Efek anti-inflamasi dilakukan dengan pemeriksaan imunohistokimia dengan antibodi anti-IL-6 dan menghitung jumlah lekosit darah tepi.

Hasil Penelitian. Lendir bekicot *A. fulica* mengandung flavonoid, senyawa fenol, saponin dan steroid, selain itu juga mengandung enzim antioksidan SOD, CAT dan GPX. Enzim antioksidan secara signifikan ($p < 0,05$) memberikan perlindungan terhadap radiasi sinar UVA maupun UVB dengan menjaga kadar enzim antioksidan endogen tetap stabil dan melindungi kulit dari perubahan histopatologis. Enzim antioksidan tidak berpengaruh secara signifikan pada aktivitas IL-6 pasca radiasi sinar UVA, namun bermakna pada radiasi sinar UVB. Selain itu lendir bekicot juga berperan menekan mobilisasi lekosit pada peradangan akut yang signifikan pada radiasi sinar UVA maupun UVB.

Kesimpulan. Lendir bekicot *A. fulica* mengandung antioksidan enzimatik dan non-enzimatik, dan dapat berperan sebagai fotoprotektor dan anti-inflamasi terhadap radiasi sinar UVA dan UVB.

Kata kunci: *A. fulica*, anti-inflamasi, enzim antioksidan, fotoprotektor, lendir bekicot, UV

THE EFFECT OF *Achatina fulica* SNAIL MUCUS EXTRACT ON SUNBURN MODEL MICE INDUCED BY ULTRAVIOLET RADIATION A AND B

ABSTRACT

Background. Sunburn is an acute inflammation caused by UV radiation, characterized by erythema, pain, and edema in the skin. Sunburn management has shifted from treatment to prevention, including the use of sunscreen. *Achatina fulica* (*A. fulica*) snail mucus is currently a popular active ingredient in skincare, yet its potential as a photoprotector and anti-inflammatory against UV radiation exposure remains under-researched.

Objective. This study aimed to investigate the enzymatic and non-enzymatic antioxidant contents in *A. fulica* snail mucus, and its role as a photoprotector and anti-inflammatory.

Method. This was an experimental study using a post-test only control group design, involving 75 BALB/c *Mus musculus* mice in 15 groups. Snail mucus was formulated into solutions in several doses (20%, 50%, 70%, and 100%) and applied one hour before UVA and UVB radiation exposure. The photoprotective effect was assessed by evaluating the levels of the antioxidant enzymes SOD, CAT, and GPX after UV radiation exposure and through semi-quantitative histopathological examination observing changes in the mice skin including the formation of sunburn cells, crusts, ulcerations, and dermal inflammation using a scoring system. The anti-inflammatory effect was evaluated through immunohistochemical examination with anti-IL-6 antibody and counting peripheral blood leukocytes.

Results. *A. fulica* snail mucus contains flavonoids, phenolic compounds, saponins, and steroids, as well as antioxidant enzymes SOD, CAT, and GPX. These antioxidants significantly ($p < 0.05$) provide protection against both UVA and UVB radiation by stabilizing endogenous antioxidant enzyme levels and protecting the skin from histopathological changes. Antioxidant enzymes did not significantly impact IL-6 activity after UVA radiation but were significant after UVB radiation. Additionally, snail mucus also played a role in suppressing leukocyte mobilization in acute inflammation significantly under both UVA and UVB radiation.

Conclusion. *A. fulica* snail mucus contains both enzymatic and non-enzymatic antioxidants, and can act as a photoprotector and anti-inflammatory against UVA and UVB radiation.

Keywords: *A. fulica*, anti-inflammatory, antioxidant enzymes, photoprotector, snail mucus, UV