

Uji penghambatan aktivitas elastase, uji antioksidan, dan uji manfaat gel yang mengandung ekstrak tanaman buah makasar (*Rhus javanica* L.) = Anti-elastase, antioxidant activity, and efficacy test of topical gel containing macassar kernels (*Rhus javanica* L.)

Nadia Bunga Anggraini, author

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Abstrak

Saat ini penelitian potensi bahan herbal sebagai agen kosmetik meningkat secara signifikan. Penelitian sebelumnya menyatakan bahwa ekstrak *Rhus javanica* dapat menghambat aktivitas enzim elastase dan sebagai antioksidan. Penelitian ini bertujuan untuk membuktikan aktivitas penghambatan elastase, aktivitas antioksidan dan membuat sediaan gel yang stabil secara fisik dan bermanfaat terhadap elastisitas kulit. Ekstrak etanol daun, batang, buah hijau, buah hitam dilakukan uji aktivitas anti elastase, uji antioksidan, dan uji kadar fenolik. Ekstrak yang menghambat elastase terbaik digunakan sebagai bahan aktif dalam formulasi, dan dilakukan uji stabilitas fisik selama 12 minggu. Pengamatan adanya potensi iritasi dilakukan selama 24 jam. Uji manfaat dilakukan pada 28 wanita dengan parameter elastisitas yang diukur perubahannya selama 28 hari pada lengan atas bagian volar. Ekstrak batang memberikan penghambatan elastase yang terbaik ($IC_{50} = 245,68$ bpj), tetapi memiliki nilai kadar fenolik dan aktivitas antioksidan yang paling lemah (IC_{50} DPPH = $561,05$ bpj; FRAP = $49,46 \pm 41,10$ mol/gram; TPC = $28,05 \pm 2,12$ mg GAE/g). Aktivitas antielastase dengan kadar fenolik memiliki hubungan korelasi yang lemah ($r = 0,352$). Gel ekstrak batang 10 % diketahui memiliki stabilitas terbaik. Pada penyimpanan suhu rendah minggu ke-8, kadar fenolik dalam gel ekstrak 10 % hanya mengalami penurunan 4,65 %, dibandingkan gel ekstrak 5 % (17,28 %). Sediaan gel ekstrak batang tidak mengiritasi kulit dan memberikan peningkatan signifikan terhadap derajat elastisitas ($p < 0,05$). Nilai IC_{50} antielastase ekstrak batang memiliki korelasi yang sempurna dengan elastisitas kulit ($r = 0,891$). Kesimpulan dari penelitian ini adalah ekstrak batang *Rhus javanica* memiliki potensi penghambat aktivitas elastase, serta sediaan gel ekstrak batang *Rhus javanica* aman dan efektif dalam meningkatkan elastisitas kulit.

.....Nowadays, kind of research related with the potential of herbal ingredients as cosmetic agent has increased significantly. Previous research reported that the extract of *Rhus javanica* was able to inhibit elastase activity and as an antioxidant agent. This research aimed to show the activity of antioxidant and anti-elastase as well as providing the topical gel supply that stable physically and its efficacy for skin elasticity. The extract of leave, stem, green fruit, black fruit were tested for anti-elastase activity, antioxidant, and determination of phenolic level. The extract that gives the best elastase inhibition was used as the active ingredient for the gel supply and its physical stability were tested out for 12 weeks. Skin irritation test was observed for 24 hours. The efficacy test was performed on 28 women with skin elasticity measured for 28 days in the volar upper arm. The stem extract provided the best elastase inhibition ($IC_{50} = 245,68$ ppm), but its polyphenol and the antioxidant activity were the weakest (IC_{50} DPPH = $561,05$ ppm; FRAP = $49,46 \pm 41,10$ mol/gram; TPC = $28,05 \pm 2,12$ mg GAE/g). The anti-elastase activity and the value of phenolic having a weak correlation value ($r = 0,352$). The gel containing 10 % extract had the best stability because at week-8 low-temperature storage, phenolic levels in its gel had only decreased 4,65 %, compared to 5 % extract gel (17,28 %). The irritation and efficacy test result indicated that the extract gel

did not cause any skin irritation and significantly improved skin elasticity ($p < 0.05$). The IC50 antielastase had a perfect correlation with skin elasticity ($r = 0,891$). The conclusion of the study are that the stem extract of *Rhus javanica* had potential anti-elastase activity, as well as the gel containing stem extract were safe and effective in enhancing skin elasticity.