

# Formulasi Gel Fraksi Daun *Rubus fraxinifolius* sebagai Sediaan Anti-Aging Hasil Optimasi Berbagai Metode Ekstraksi = Gel Formulation of *Rubus fraxinifolius* Leaf as an Anti-Aging Preparation Optimized by Various Extraction Methods

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## Abstrak

Paparan sinar UV yang berlebihan merupakan salah satu faktor ekstrinsik penyebab terjadinya penuaan dini, yaitu akibat terbentuknya radikal bebas dan Reactive Oxygen Species (ROS). *Rubus fraxinifolius* Poir. terutama pada bagian daunnya terbukti secara *in vitro* memiliki sifat antipenuaan dengan cara mencegah aktivitas enzim elastase. Tujuan dari penelitian ini adalah menganalisis kadar total fenol, kadar total flavonoid, aktivitas antioksidan DPPH (1,1-difenil-2-pikrilhidrazil), FRAP (Ferri Reducing Antioxidant Power) dan ABTS (2,2'-azino-bis(3-ethylbenzothiazoline-6-sulfonic acid) serta aktivitas penghambatan elastase dari ekstrak (hasil optimasi jenis daun dan optimasi metode ekstraksi) dan fraksi daun *Rubus fraxinifolius*, selanjutnya fraksi ter-aktif diformulasikan dalam sediaan gel. Penelitian diawali dengan optimasi jenis daun terlebih dahulu dengan cara ekstraksi terhadap daun tua dan daun muda secara Soxhlet, dan dievaluasi aktivitas antioksidan dan aktivitas penghambatan elastase. Selanjutnya dilakukan optimasi metode ekstraksi secara Soxhlet, Microwave Assisted Extraction (MAE) dan Ultrasound Assisted Extraction (UAE) kemudian dievaluasi aktivitas antioksidan dan aktivitas penghambatan elastase. Ekstrak teraktif selanjutnya dilakukan fraksinasi dengan n-heksana, etil asetat, dan aquadest. Fraksi teraktif dilakukan pengujian antioksidan dan aktivitas penghambatan elastase, kemudian diidentifikasi menggunakan LC-MSMS. Berdasarkan hasil optimasi jenis daun, ekstrak daun tua memiliki kinerja yang lebih baik dibandingkan dari daun muda dalam hal aktivitas antioksidan dan aktivitas penghambatan enzim elastase. Sedangkan hasil optimasi metode ekstraksi, UAE memberikan hasil terbaik untuk selanjutnya difraksinasi dan fraksi aquadest memberikan hasil terbaik aktivitas antioksidan dan aktivitas penghambatan enzim elastase. Formulasi gel fraksi aquadest dari metode ekstraksi secara UAE menunjukkan pada formula 1 dengan konsentrasi fraksi daun *Rubus* 3% memberikan hasil yang lebih baik dan stabil selama masa penyimpanan 12 minggu.

.....Excessive exposure to UV light is one of the extrinsic factors that causes premature aging, which is due to the formation of free radicals and Reactive Oxygen Species (ROS). *Rubus fraxinifolius* Poir. especially in the leaves have antiaging *in vitro* properties by preventing the activity of elastase enzyme. The purpose of this study was to analyze total phenol levels, total flavonoid levels, antioxidant activity of DPPH (1,1-diphenyl-2-pikrilhidrazil), FRAP (Ferri Reducing Antioxidant Power) and ABTS (2,2'-azino-bis(3-ethylbenzothiazoline-6-sulfonic acid) also elastase inhibitory activity of the extract (from optimizing leaf types and optimizing extraction methods) and *Rubus fraxinifolius* leaf fractions, then the most active fractions are formulated in Gel preparations. The research begins with optimizing leaf types first, by extraction old leaves and young leaves used Soxhlet method, and evaluated their antioxidant activity and elastase inhibition activity. Furthermore, optimization of extraction methods (Soxhlet, Microwave Assisted Extraction/ MAE and Ultrasound Assisted Extraction/ UAE) was carried out and then evaluated antioxidant activity and elastase inhibitory activity. Active extract then fractionated with n-hexane, ethyl acetate, and

aquadest. The most active fraction was tested for antioxidant and elastase inhibitory activity, then identified using LC-MSMS. Based on the optimization of leaf types, old leaf extract has better performance than young leaves in terms of antioxidant activity and elastase enzyme inhibitory activity. While the optimization results of extraction method UAE gave the best results. Fractionation process gave aquadest fraction the best results for antioxidant activity and elastase enzyme inhibitory activity. The gel formulation of the aquadest fraction from the UAE extraction method showed that formula 1 with a concentration of 3% Rubus leaf fraction gave better and more stable results during a storage period of 12 weeks.