

ABSTRACT

IN VIVO STUDY: THE POTENTIAL OF CELERY ESSENTIAL OIL (*Apium graveolens* L.) AS A HAIR GROWTH AGENT IN MALE NEW ZEALAND WHITE RABBITS

By

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Background: Hair loss is a common dermatological condition affecting physical appearance, psychological well-being, and self-confidence. Minoxidil is widely used to stimulate hair growth, however, long-term use is often associated with adverse effects, including scalp irritation and dermatitis, encouraging the search for safer and more sustainable natural alternatives. Celery (*Apium graveolens* L.) contains essential oil rich in bioactive compounds such as limonene, selinene, and apioil that may enhance scalp microcirculation and follicular metabolism, thereby supporting hair growth.

Methods: Conducted as an in vivo experimental investigation using male New Zealand White rabbits with a split-body design. Celery essential oil was obtained by distillation and diluted with liquid paraffin to concentrations of 1%, 1,5%, and 2%. Treatment groups included a negative control (liquid paraffin), a positive control (2% minoxidil), and celery essential oil at the three concentrations. All formulations were applied topically to the dorsal area for 21 days. Hair growth was evaluated based on hair length (mm) and hair density (hairs/cm²). Data were analyzed using One-Way ANOVA and Post Hoc analysis.

Results: Celery essential oil significantly enhanced hair growth compared to the negative control, with significant differences observed among treatment groups in hair length and density. Hair length increased significant, with mean values 14,33 mm (1%), 16,39 mm (mm), and 18,60 mm (2%), where the 2% essential oil did not differ significantly from 2% minoxidil. Hair density also increased significant, with mean values 483,33 hairs/cm² (1%), 542,33 hairs/cm², and 583,33 hairs/cm² (2%). This indicates that increasing concentrations of celery essential oil are directly proportional to increases in both hair length and hair density.

Conclusion: Celery essential oil (*Apium graveolens* L.) demonstrated potential as a natural hair growth agent. The 2% concentration was identified as the most optimal concentration for enhancing hair length and showed effectiveness comparable to 2% minoxidil.

Keywords: *Apium graveolens*, Celery essential oil, Hair growth, Minoxidil, Rabbit.

ABSTRAK

STUDI IN VIVO: POTENSI MINYAK ATSIRI SELEDRI (*Apium graveolens* L.) SEBAGAI AGEN PENUMBUH RAMBUT PADA KELINCI JANTAN *NEW ZEALAND WHITE*

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Latar Belakang: Kerontokan rambut merupakan masalah dermatologis yang memengaruhi penampilan fisik dan kepercayaan diri. Minoxidil umum digunakan merangsang pertumbuhan rambut, namun penggunaan jangka panjang dikaitkan dengan efek samping seperti iritasi kulit kepala dan dermatitis. Seledri (*Apium graveolens* L.) mengandung minyak atsiri kaya senyawa bioaktif seperti limonene, selinene, dan apiol, yang berpotensi meningkatkan mikrosirkulasi kulit kepala serta metabolisme folikel, sehingga mendukung pertumbuhan rambut.

Metode: Studi eksperimental *in vivo* menggunakan kelinci jantan galur *New Zealand White* dengan desain *split-body*. Minyak atsiri seledri diperoleh melalui destilasi dan diencerkan dengan parafin cair hingga konsentrasi 1%, 1,5%, dan 2%. Kelompok perlakuan meliputi kontrol negatif, kontrol positif (minoxidil 2%), serta minyak atsiri seledri pada ketiga konsentrasi, yang diaplikasikan secara topikal pada area punggung selama 21 hari. Parameter pertumbuhan rambut yang diamati meliputi panjang (mm) dan kepadatan rambut (helai/cm²). Data dianalisis menggunakan uji *One-Way ANOVA* dan analisis *Post Hoc*.

Hasil: Minyak atsiri seledri secara signifikan meningkatkan pertumbuhan rambut, dengan perbedaan bermakna pada setiap parameter. Panjang rambut meningkat dengan nilai rata-rata 14,33 mm (1%), 16,39 mm (1,5%), dan 18,60 mm (2%), di mana konsentrasi minyak atsiri 2% tidak berbeda signifikan dengan minoxidil 2%. Kepadatan rambut juga meningkat, dengan nilai rata-rata 483,33 helai/cm² (1%), 542,33 helai/cm² (1,5%), dan 583,33 helai/cm² (2%), yang menunjukkan peningkatan konsentrasi minyak atsiri berbanding lurus dengan peningkatan panjang dan kepadatan rambut.

Kesimpulan: Minyak atsiri seledri (*Apium graveolens* L.) berpotensi sebagai agen penumbuh rambut alami. Konsentrasi 2% diidentifikasi sebagai konsentrasi paling optimal dalam meningkatkan panjang dan kepadatan rambut, serta menunjukkan efektivitas yang sebanding dengan minoxidil 2%.

Kata kunci: *Apium graveolens*, Kelinci, Minoxidil, Minyak atsiri seledri, Pertumbuhan rambut.