

PENGARUH LAMA PENYIMPANAN BAHAN DAN METODE PENYULINGAN TERHADAP RENDEMEN DAN KUALITAS MINYAK ATSIRI DAUN PINUS (*Pinus merkusii* Jungh. et de Vriese)

Nafitah¹, Rini Pujiarti²

INTISARI

Minyak atsiri merupakan hasil hutan non kayu yang diperoleh melalui ekstraksi berbagai bagian tumbuhan. Daun *Pinus merkusii* Jungh. et de Vriese berpotensi dikembangkan sebagai sumber minyak atsiri, tetapi penelitian terkait pemanfaatannya di Indonesia masih terbatas. Lama penyimpanan daun pinus dan metode penyulingannya dapat memengaruhi rendemen dan kualitas minyak atsiri yang dihasilkan. Penelitian ini bertujuan untuk mengetahui pengaruh lama penyimpanan bahan dan metode penyulingan terhadap rendemen dan kualitas minyak atsiri daun pinus.

Penelitian ini menggunakan Rancangan Acak Lengkap (RAL) dengan dua faktor. Faktor lama penyimpanan bahan terdiri atas tiga aras, yaitu 3 hari, 6 hari, dan 9 hari, sedangkan faktor metode penyulingan terdiri atas dua aras, yaitu metode rebus dan kukus. Pengujian yang dilakukan terhadap minyak atsiri daun pinus berupa rendemen, komposisi kimia menggunakan GC-MS, serta sifat fisiko-kimia berdasarkan Standar Nasional Indonesia (SNI 7633:2020). Data rendemen, bobot jenis, indeks bias, sisa penguapan, dan bilangan asam dianalisis menggunakan analisis ragam (*two-way* ANOVA) yang dilanjutkan dengan uji *Tukey Honestly Significant Difference* (HSD), sedangkan data komposisi kimia dan organoleptik dianalisis secara deskriptif.

Hasil penelitian menunjukkan bahwa interaksi lama penyimpanan bahan dan metode penyulingan berpengaruh terhadap komposisi kimia, bobot jenis dan sisa penguapan. Persentase komponen utama 3-Carene dan D-Limonene cenderung lebih tinggi pada penyimpanan singkat dengan metode kukus, sedangkan α -Pinene meningkat pada penyimpanan lebih lama dengan metode rebus. Persentase Caryophyllene cenderung meningkat pada penyimpanan menengah dengan metode kukus. Lama penyimpanan bahan berpengaruh signifikan terhadap peningkatan rendemen basah dan rendemen kering serta penurunan sisa penguapan, sementara metode penyulingan kukus secara signifikan menghasilkan rendemen kering dan sisa penguapan lebih tinggi dibandingkan metode rebus. Karakteristik minyak atsiri daun pinus yang dihasilkan meliputi rendemen basah 0,07–0,22%; rendemen kering 0,16–0,36%; kandungan 3-Carene 29,84–35,12%, α -Pinene 19,48–32,22%, D-Limonene 10,62–15,04%, dan Caryophyllene 3,02–13,53%; dengan warna jernih kekuningan dan bau khas daun pinus; bobot jenis 0,850–0,862; indeks bias 1,471–1,473; sisa penguapan 1,8–4,4%; serta bilangan asam 0,45–0,52.

Kata Kunci: minyak atsiri pinus, lama penyimpanan, metode penyulingan, kualitas

¹ Mahasiswa Fakultas Kehutanan UGM

² Staff Pengajar Fakultas Kehutanan UGM

EFFECT OF STORAGE DURATION AND DISTILLATION METHOD ON YIELD AND QUALITY OF PINE (*Pinus merkusii* Jungh. et de Vriese) NEEDLE ESSENTIAL OIL

Nafitah¹, Rini Pujiarti²

ABSTRACT

*Essential oils are non-timber forest products obtained through the extraction of various plant parts. Pine (*Pinus merkusii* Jungh. et de Vriese) needles have the potential to be developed as a source of essential oils; however, research in Indonesia remains limited. The storage duration of pine needles and distillation methods may affect the yield and quality of essential oils. This study aims to determine the effects of storage duration and distillation methods on yield and quality of essential oil extracted from pine needles.*

This study used a completely randomized design (CRD) with two factors. The storage duration factor consisted of three levels (3 days, 6 days, and 9 days), while the distillation method factor consisted of two levels (hydro distillation and steam-hydro distillation). The tests conducted on pine needle essential oil were yield, chemical composition using GC-MS, and physicochemical properties based on the Indonesian National Standard (SNI 7633:2020). Data on yield, specific gravity, refractive index, evaporation residue, and acid number were analyzed using analysis of variance (two-way ANOVA) continued with Tukey Honestly Significant Difference (HSD) test, while data on chemical composition and organoleptic were analyzed descriptively.

The results showed that the interaction between storage duration and distillation method affected the chemical composition, specific gravity, and evaporation residue of pine leaf essential oil. The percentages of the main components, 3-Carene and D-Limonene, tended higher in short storage duration using steam-hydro distillation method, while α -Pinene tended increase with longer storage duration using hydro distillation method. Caryophyllene tended increase in middle storage with steam-hydro distillation method. Storage duration significantly impacted the increased of wet yield and dry yield and decreased of evaporation residue, while the steam-hydro distillation method significantly produced higher dry yield and evaporation residue than the hydro distillation method. The characteristics of pine needle essential oil included wet yield 0.07–0.22%; dry yield 0.16–0.36%; 3-Carene content 29.84–35.12%, α -Pinene content 19.48–32.22%, and D-Limonene content 10.62–15.04%; with a clear yellowish color and a distinctive pine needle aroma; specific gravity 0.850–0.862; refractive index 1.471–1.473; evaporation residue 1.8–4.4%; and acid number 0.45–0.52.

Keywords: pine needle essential oil, storage duration, distillation method, quality

¹ Student of Faculty of Forestry UGM

² Lecturer of Faculty of Forestry UGM