

## ABSTRAK

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### **PENGARUH PENAMBAHAN *ESSENTIAL OIL Eucalyptus globulus* DAN AIR *Citrus limon* (L.) Osbeck TERHADAP KARAKTERISTIK FISIKOKIMIA AIR REBUSAN *Caesalpinia sappan* L.**

Skripsi, Fakultas Sains dan Teknologi (2021).

(xv + 63 halaman; 26 gambar; 4 tabel; 16 lampiran)

Tanaman secang merupakan salah satu tanaman rempah yang terdapat pada negara Indonesia. Kayu secang (*Caesalpinia sappan* L.) memiliki komponen senyawa bioaktif seperti brasilin, brasilein, 3-O-metilbrazilin, saponin, asam galat, minyak asiri, asam amino, karbohidrat, tanin, alkaloid, flavonoid, dan terpenoid. Warna merah kecoklatan didapatkan dari komponen brasilein yang teroksidasi atau dalam keadaan basa dan komponen brasilin dapat memberikan efek melindungi tubuh dari keracunan akibat radikal bebas. Air rebusan kayu secang dengan penambahan lemon akan memengaruhi pH dan warna dari air rebusan tersebut. Penelitian ini bertujuan untuk menentukan konsentrasi lemon dan konsentrasi *essential oil Eucalyptus globulus* yang ditambahkan ke dalam air rebusan kayu secang agar menghasilkan air rebusan kayu secang terbaik. Penggunaan suhu perebusan (70, 80, dan 90°C) berdasarkan analisis aktivitas antioksidan, total fenolik, total flavonoid, total antosianin, warna, dan pH menghasilkan air rebusan kayu secang terbaik pada suhu perebusan 90°C. Air rebusan kayu secang terbaik memiliki nilai IC<sub>50</sub> sebesar 2969,03±29,39 ppm; total fenolik sebesar 4,81±0,06 mg GAE/mL; total flavonoid sebesar 0,30±0,01 mg QE/mL; total antosianin sebesar 35,93±1,41 mg/L; nilai *Hue* sebesar 14,33±0,47; nilai *lightness* sebesar 39,12±0,68; dan pH sebesar 6,97±0,07. Penambahan konsentrasi lemon (1; 2; dan 3%) dan konsentrasi *essential oil Eucalyptus globulus* (0,05; 0,1; dan 0,15%) berdasarkan analisis aktivitas antioksidan, total fenolik, total flavonoid, total antosianin, warna, dan pH menghasilkan air rebusan kayu secang terbaik dengan konsentrasi air lemon 3% dan konsentrasi *essential oil Eucalyptus globulus* 0,15%. Air rebusan kayu secang dengan penambahan air lemon dan *essential oil Eucalyptus globulus* terbaik memiliki nilai IC<sub>50</sub> sebesar 1380,20±16,21 ppm; total fenolik sebesar 4,67±0,13 mg GAE/mL; total flavonoid sebesar 0,14±0,03 mg QE/mL; total antosianin sebesar 55,47±1,14 mg/mL; *lightness* sebesar 47,88±0,73; dan pH sebesar 3,18±0,01.

Kata Kunci : Air lemon, aktivitas antioksidan, *essential oil Eucalyptus globulus*, kayu secang, suhu.

Referensi : 83 (2008-2020)

## ABSTRACT

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### **EFFECT FROM ADDITION OF ESSENTIAL OIL *Eucalyptus globulus* AND *Citrus Limon* (L.) Osbeck WATER ON PHYSIOCHEMICAL CHARACTERISTICS OF *Caesalpinia sappan* L. BOILED WATER**

Final Essay for Faculty of Science and Technology (2021)

(xv + 63 pages; 26 figures; 4 tables; 16 appendices)

Sappan is one of a plant that can be found in the land of Indonesia. The Sappan wood (*Caesalpinia sappan* L.) has bioactive compounds such as brazilin, brazilein, 3-O-metilbrazilin, saponins, gallic acids, essential oil, amino acids, carbohydrates, tannin, alkaloids, flavonoids, terpenoids. Red-brownish color obtained from brazilein compound that oxidized or in an alkaline state and the brazilin compound can protect body from poisoning of the free radical. The water which is resulted from boiling sappan wood if added with lemon will affecting pH and the color of said boiled water. This study aims to analyze the concentration of lemon and *Eucalyptus globulus* essential oil which is added to the sappan wood boiled water in order to produce the best result of sappan wood boiled water. The use of boiling temperature (70, 80, and 90°C) based on the analysis of antioxidant activity, total phenolic, total flavonoids, total anthocyanins, color, and pH resulted in the best secang wood boiling water at a boiling temperature of 90°C. The best sappan wood boiled water has an IC<sub>50</sub> value of 2969,03±29,39 ppm; total phenolic 4,81±0,06 mg GAE/mL; total flavonoids of 0,30±0,01 mg QE/mL; total anthocyanins amounted to 35,93±1,41 mg/L; Hue value 14,33±0,47; lightness value 39,12±0,68; and with pH of 6,97±0,07. Addition of lemon water concentration (1; 2; and 3%) and *Eucalyptus globulus* essential oil concentration of (0.05; 0.1; and 0.15%) based on the analysis of antioxidant activity, total phenolic, total flavonoids, total anthocyanins, color, and pH resulted in the best sappan wood boiled water with a concentration of 3% lemon water and 0.15% *Eucalyptus globulus* essential oil concentration. The best sappan wood boiled water with the addition of lemon water and *Eucalyptus globulus* essential oil has an IC<sub>50</sub> value of 1380,20±16,21 ppm; total phenolic value of 4,67±0,13 mg GAE/mL; total flavonoids of 0,14±0,03 mg QE/mL; total anthocyanin amounted to 55,47±1,14 mg/mL; lightness value of 47,88±0,73; and with pH of 3,18±0,01.

Keyword(s) : Antioxidant activity, *Eucalyptus globulus* essential oil, lemon water, sappan wood, temperature.

Reference(s) : 83 (2008-2020)