

ABSTRAK

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Latar Belakang : Stres oksidatif dari pola makan modern berkontribusi terhadap penyakit tidak menular seperti jantung, diabetes, dan kanker. Umbi sarang semut (*Myrmecodia sp.*) mengandung flavonoid, tanin, saponin, alkaloid, dan triterpenoid yang berpotensi sebagai antioksidan.

Tujuan : Mengetahui pengaruh perlakuan bentuk, metode pemanasan dan (rasio berat sarang semut/air) terhadap kandungan fitokimia dan aktivitas antioksidannya.

Metode : Penelitian RAL dengan tiga faktor: bentuk (B1= irisan, B2= serbuk); metode pemanasan (P1= rebus, P2= seduh); rasio sarang semut dengan air (R1= 1%, R2= 3%, R3= 5%). Sampel 39, 12 kelompok perlakuan, 1 kelompok standar ekstrak etanol. Uji fitokimia dan antioksidan dengan DPPH dan spektrofotometri UV-Vis. Analisis statistik: uji Kruskal Wallis dan Mann-whitney.

Hasil : Perbedaan bentuk berpengaruh sangat signifikan ($p < 0.01$), bentuk umbi *M. pendens* serbuk (B2) lebih unggul daripada iris (B1) pada semua fitokimia dan IC_{50} . Metode pemanasan tidak berpengaruh signifikan antara kelompok perlakuan rebus (P1) dan seduh (P2) kecuali tanin, pada rebus menghasilkan 8,5 kali lebih besar dari seduh. Rasio berpengaruh signifikan selektif, terutama pada R1 (rasio 1%) lebih tinggi kandungan alkaloid (3.7 kali), fenol (0.2 kali) dan flavonoid (1,4 kali) dari R3 (rasio 5%). Kombinasi ketiganya berpengaruh sangat signifikan ($p < 0,01$) terhadap seluruh fitokimia dan aktivitas antioksidan. Perlakuan kombinasi optimal diperoleh menggunakan metode skor pada B2P2R1 (serbuk, seduh, rasio 1%). Kandungan flavonoid dan tanin menunjukkan korelasi negatif yang signifikan dan tertinggi terhadap IC_{50} .

Simpulan : Kombinasi bentuk serbuk, metode pemanasan dan rasio berpengaruh pada kandungan fitokimia dan aktivitas antioksidan ekstrak umbi sarang semut. Bentuk serbuk (B2), metode seduh (P2), dan rasio 1% (R1) paling mendekati kelompok standar metode ekstraksi maserasi etanol.

Kata kunci : Umbi Sarang Semut, Bentuk, Rasio, Fitokimia, Aktivitas Antioksidan

ABSTRACT

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Background : *Oxidative stress resulting from modern diets plays a role in the development of non-communicable diseases such as heart disease, diabetes, and cancer. Ant nest tubers (*Myrmecodia* sp.) are rich in flavonoids, tannins, saponins, alkaloids, and triterpenoids, which hold potential as antioxidants.*

Objective : *To determine the effect of altering form, heating method and ratio of ant nest per water weight on its phytochemical content and antioxidant activity.*

Method : *The RAL model research involves form (B1 = slice, B2 = powder), heating method (P1 = boil, P2 = brew), and ant nest to water ratio (R1 = 1%, R2 = 3%, R3 = 5%). It includes 39 samples in 12 treatment groups and one standard ethanol extract group. Phytochemical and antioxidant tests use DPPH and UV-Vis spectrophotometry. Statistical analysis employs Kruskal-Wallis and Mann-Whitney tests.*

Result : *The difference in form of the *M. pendens* tuber exerts a significant effect ($p < 0.01$), with the powder form (B2) demonstrating superiority over the slice form (B1) in all measured phytochemicals and IC_{50} values. The method of heating does not exhibit a significant effect between the boiled (P1) and brewed (P2) groups, except in the case of tannin content, where the boiled method yields 8.5 times more tannin than the brewed method. The ratio of components has a selective impact, with the R1 (1% ratio) condition resulting in higher levels of alkaloids (3.7 times), phenols (0.2 times), and flavonoids (1.4 times) compared to the R3 (5% ratio) condition. The combination of all three factors significantly affects ($p < 0.01$) the phytochemical content and antioxidant activity. The optimal treatment was determined using the score method, identified as B2P2R1 (powder, brewed, 1% ratio). A significant negative correlation and the highest was observed between flavonoid and tannin content towards IC_{50} values.*

Conclusion : *The phytochemical composition and antioxidant activity of ant nest tuber extract are influenced by the form of the powder, the heating method, and the concentration ratio. Specifically, the powder form (B2), brewing method (P2), and a 1% concentration ratio (R1) most closely align with the standard ethanol maceration extraction method.*

Keyword : *Ant nest tuber, Form, Ratio, Phytochemical, Antioxidant activity*