

RINGKASAN

Daun kumis kucing (*Orthosiphon aristatus*) merupakan tanaman yang sering dimanfaatkan sebagai obat tradisional karena mengandung senyawa bioaktif antara lain saponin, polifenol, sapofonin, myoinositol, orthosipon glikosida, minyak atsiri, dan garam kalium (Riska, 2024). Kandungan polifenol pada daun kumis kucing diketahui dapat memberikan berbagai manfaat bagi kesehatan antara lain dapat menurunkan kadar asam urat, meningkatkan efek antioksidan, anti inflamasi, antihipertensi, antidiabetes, dan antimikroba serta memiliki efek diuretik. Akan tetapi, polifenol yang berfungsi sebagai antioksidan sangat rentan terhadap perlakuan panas. Oleh karena itu, kondisi penyeduhan berupa suhu dan waktu pada teh perlu diperhatikan agar kadar polifenol tetap terjaga. Penelitian ini bertujuan untuk 1) mengetahui model optimum suhu dan waktu penyeduhan teh hitam celup daun kumis kucing dengan penambahan daun mint 2) mengetahui suhu dan waktu penyeduhan optimum terhadap kadar polifenol teh hitam celup daun kumis kucing dengan penambahan daun mint, dan 3) mengetahui karakterisasi produk optimum dari suhu dan waktu penyeduhan teh hitam celup daun kumis kucing dengan penambahan daun mint.

Penelitian ini menggunakan metode *Respon Surface Methodology* (RSM) dengan rancangan *Central Composite Design* (CCD) yang dianalisis menggunakan *software Design Expert* versi 13. Faktor yang diteliti meliputi suhu penyeduhan pada rentang 60 – 90°C dan waktu penyeduhan pada rentang 1 – 5 menit. Respon utama yang diteliti yaitu kadar polifenol. Terdapat empat tahap penelitian yaitu pembuatan produk, optimasi produk, verifikasi dan validasi, serta karakterisasi. Verifikasi dilakukan sebanyak 3 kali pengulangan. Setelah data dikatakan valid, dilakukan karakterisasi pada kondisi optimum berupa uji sensorial (warna, aroma, rasa, dan *overall*) dan aktivitas antioksidan.

Hasil kondisi optimum berdasarkan *software* yaitu pada suhu penyeduhan 90°C dengan waktu 5 menit dengan nilai *desirability* sebesar 0,83. Model dari penelitian ini adalah linear dengan nilai p-value dinyatakan signifikan. Hasil perhitungan ANOVA yaitu *lack of fit* tidak signifikan, R^2 sebesar 0,7731, selisih antara *adjusted R^2* dan *predicted R^2* sebesar 0,1591, *adeq precision* sebesar 12,0028, dan nilai VIF 1. Kadar polifenol pada kondisi optimum sebesar 4367,68 mg/kg. Kadar air dari bubuk teh hitam daun kumis kucing dengan penambahan daun mint sebesar 14%. Karakterisasi sensorial seduhan pada kondisi optimum yaitu warna 3,5 (cokelat), warna 2,15 (tidak hijau), aroma 3,35 (agak khas teh), rasa 2,45 (tidak sepat), rasa 3,4 (agak khas kumis kucing), dan *overall* 3,6 (suka), serta aktivitas antioksidan (% inhibisi) sebesar 84,42%.

SUMMARY

Cat's whisker leaves (*Orthosiphon aristatus*) are plants that are often used as traditional medicine because they contain bioactive compounds, including saponins, polyphenols, saponins, myoinositol, orthosiphon glycosides, essential oils, and potassium salts (Riska, 2024). The polyphenol content in cat's whisker leaves is known to provide various health benefits, including lowering uric acid levels, increasing antioxidant, anti-inflammatory, antihypertensive, antidiabetic, and antimicrobial effects, and having diuretic effects. However, polyphenols that function as antioxidants are very susceptible to heat treatment. Therefore, the brewing conditions in the form of temperature and time in tea need to be considered so that polyphenol levels are maintained. This study aims to 1) determine the optimum model of temperature and time for brewing black tea with cat's whiskers leaf bags with the addition of mint leaves 2) determine the optimum temperature and time for brewing on the polyphenol content of black tea with cat's whiskers leaf bags with the addition of mint leaves, and 3) determine the optimum product characterization of the temperature and time for brewing black tea with cat's whiskers leaf bags with the addition of mint leaves.

This study uses the Response Surface Methodology (RSM) method with the Central Composite Design (CCD) design, which is analyzed using Design Expert software version 13. The factors studied include brewing temperature in the range of 60 - 90 ° C and brewing time in the range of 1 - 5 minutes. The main response studied is the polyphenol content. There are four stages of research, namely product manufacturing, product optimization, verification and validation, and characterization. Verification is carried out 3 times. After the data is said to be valid, characterization is carried out under optimum conditions in the form of sensory tests (color, aroma, taste, and overall) and antioxidant activity. The optimum condition results based on the software are at a brewing temperature of 90°C, with a time of 5 minutes, with a desirability value of 0,83. The model of this study is linear, with a p-value stated as significant. The results of the ANOVA calculation are lack of fit is not significant, R^2 is 0,7731, the difference between adjusted R^2 and predicted R^2 is 0,1591, adeq precision is 12,0028, and the VIF value is 1. The polyphenol content at optimum conditions is 4367.68 mg/kg. The water content of black tea powder from cat's whiskers leaves, with the addition of mint leaves, is 14%. The sensory characterization of the brew at optimum conditions was color 3,5 (brown), color 2,15 (not green), aroma 3,35 (slightly tea-like), taste 2,45 (not astringent), taste 3,4 (slightly cat's whisker-like), and overall 3.6 (like), and antioxidant activity (% inhibition) of 84.42%.