

ABSTRAK

UJI PARALELISME METABOLIT KORTIKOSTERON BURUNG KENARI (*Serinus canaria*) DENGAN PEMERIKSAAN SAMPEL NON INVASIF MELALUI FESES

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Burung kenari (*Serinus canaria*) merupakan hewan model yang sensitif terhadap perubahan lingkungan dan sering digunakan dalam penelitian endokrinologi. Kortikosteron adalah glukokortikoid utama pada burung yang berperan sebagai hormon stres melalui aktivasi sumbu hipotalamus-pituitari-adrenal (HPA axis). Pengukuran kortikosteron secara konvensional dilakukan melalui pengambilan sampel darah yang bersifat invasif dan berpotensi memicu stres akut, sehingga metode non-invasif melalui feses menjadi alternatif yang relevan, khususnya pada burung berukuran kecil dengan volume darah terbatas. Penelitian ini bertujuan untuk memvalidasi metode pemeriksaan metabolit kortikosteron secara non-invasif melalui feses burung kenari menggunakan ELISA kompetitif berdasarkan uji paralelisme. Sampel feses dikoleksi dari burung kenari di Jogja Exotarium Sleman setiap Minggu selama 50 hari (13 Oktober–8 Desember 2024). Sampel kemudian diliofilisasi, diekstraksi dengan metanol 80%, dan dianalisis menggunakan kit ELISA kompetitif. Uji paralelisme dilakukan dengan membandingkan kurva pengenceran serial ekstrak feses (1:10, 1:100, 1:200, 1:400, 1:800) terhadap kurva standar kortikosteron murni. Hasil penelitian menunjukkan bahwa kurva standar kortikosteron menghasilkan persamaan $y = -0,367\ln(x) + 2,319$ dengan nilai koefisien determinasi $R^2 = 0,9473$, yang mengindikasikan validitas analitik yang baik. Kurva pengenceran serial ekstrak feses menunjukkan pola penurunan optical density (OD) yang selaras dan sejajar dengan kurva standar, menandakan tidak adanya interferensi signifikan dari komponen matriks feses terhadap ikatan antigen-antibodi dalam sistem ELISA kompetitif. Disimpulkan bahwa metode pemeriksaan metabolit kortikosteron secara non-invasif melalui feses menggunakan ELISA kompetitif telah tervalidasi berdasarkan uji paralelisme dan layak diaplikasikan pada burung kenari (*Serinus canaria*). Metode ini memberikan dasar ilmiah yang kuat untuk penelitian fisiologi stres, pemantauan kesejahteraan hewan, serta pengembangan endokrinologi non-invasif pada burung kenari secara longitudinal.

Kata kunci: burung kenari, kortikosteron, ELISA kompetitif, feses, metode non-invasif, uji paralelisme, validasi analitik

ABSTRACT

PARALLELISM TEST OF CORTICOSTERONE METABOLITES IN CANARY (*Serinus canaria*) USING NON-INVASIVE FECAL SAMPLING

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The canary (*Serinus canaria*) is a highly sensitive animal model widely used in endocrinological research due to its pronounced physiological responses to environmental stressors. Corticosterone is the primary glucocorticoid in birds, functioning as the main stress hormone through activation of the hypothalamic-pituitary-adrenal (HPA) axis. Conventional measurement of corticosterone relies on invasive blood sampling, which may induce acute stress responses and poses significant risks in small-bodied birds with highly limited blood volumes. Therefore, non-invasive fecal sampling represents a critical and ethically preferable alternative. This study aimed to validate a non-invasive method for measuring fecal corticosterone metabolites (FCM) in canaries using a competitive ELISA assay based on a parallelism test. Fecal samples were collected from canaries housed at Jogja Exotarium, Sleman, on a weekly basis over 50 days (October 13–December 8, 2024). Samples were lyophilized, extracted with 80% methanol, and analyzed using a commercial competitive ELISA kit. Parallelism was assessed by comparing serial dilution curves of fecal extracts (1:10, 1:100, 1:200, 1:400, 1:800) against the corticosterone standard curve. Results demonstrated that the corticosterone standard curve yielded the equation $y = -0.367\ln(x) + 2.319$ with a coefficient of determination $R^2 = 0.9473$, indicating strong analytical validity. The serial dilution curves of fecal extracts exhibited a declining optical density (OD) pattern that closely paralleled the standard curve, confirming the absence of significant matrix interference from fecal components on the antigen-antibody binding mechanism of the competitive ELISA system. It is concluded that the non-invasive fecal corticosterone metabolite measurement method using competitive ELISA has been validated through parallelism testing and is suitable for application in canaries (*Serinus canaria*). This method provides a robust scientific foundation for stress physiology research, animal welfare monitoring, and the advancement of non-invasive avian endocrinology in longitudinal study designs.

Keywords: canary, corticosterone, competitive ELISA, feces, non-invasive method, parallelism test, analytical validation