



# TIME-SERIES BIOLOGICAL ANALYSIS OF LONG-TAILED MACAQUE FECAL SAMPLES: FORENSIC

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STUDY PROGRAM OF VETERINARY MEDICINE  
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Bogor, July 2024

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## ABSTRACT

BELINDA CHONG JIA YIE. Time-series Biological Analysis of Long-tailed Macaque Fecal Samples: Forensic. Supervised by MAWAR SUBANGKIT, OKTI NADIA POETRI.

Long-tailed macaques (*Macaca fascicularis*) are valuable in forensic laboratory tests due to their similarities to humans. This study analyzed biological changes in macaque fecal samples over 24 hours, highlighting the need for fresh samples for accurate diagnostics. Ten healthy macaque fecal samples were examined using macroscopic examination, fluorescence imaging, and protein content assessment via the Bradford method. Results showed no significant changes in color and size, but consistency decreased from 4 to 6-hours, then increased at 8-hours. Odour score decreased initially, then increased at 8-hours. The fluorescent particle number rose up to 4-hours, then gradually decreased from 6 to 24-hours. The highest fluorescent color intensity was at 8-hours, with the lowest at 16-hours. Fluorescent particle size significantly increased at 6-hours and decreased at 16-hours. The protein content significantly rose after 2-hours, remained stable until 20-hours, and then decreased by 24-hours. No correlation was found between protein content and macroscopic examination (color, consistency, odour, size). This study underscores the dynamic biological changes in macaque fecal samples over 24 hours and the importance of using fresh fecal for accurate diagnostics.

**Keywords:** *biological analysis, fecal samples, Long-tailed macaques, time-series*



## ABSTRAK

BELINDA CHONG JIA YIE. Analisis Biologi Berbasis Deret Waktu Pada Sampel Feces Monyet Ekor Panjang: Forensik Satwa Liar. Dibimbing oleh MAWAR SUBANGKIT dan OKTI NADIA POETRI.

Monyet ekor panjang (*Macaca fascicularis*) memiliki nilai penting dalam uji laboratorium forensik karena kesamaannya dengan manusia. Studi ini menganalisis perubahan biologis dalam sampel tinja monyet selama 24 jam, menekankan perlunya sampel segar untuk diagnosis yang akurat. Sepuluh sampel tinja monyet sehat diperiksa menggunakan pemeriksaan makroskopis, pencitraan fluoresensi, dan penilaian kandungan protein dengan metode Bradford. Hasil menunjukkan tidak ada perubahan signifikan dalam warna dan ukuran, tetapi konsistensi berkurang dari 4 hingga 6-jam, kemudian meningkat pada 8-jam. Skor bau berkurang pada awalnya, kemudian meningkat pada 8-jam. Jumlah partikel fluoresen naik hingga 4-jam, kemudian secara bertahap menurun dari 6 hingga 24-jam. Intensitas warna fluoresen tertinggi adalah pada 8-jam, dengan yang terendah pada 16-jam. Ukuran partikel fluoresen meningkat secara signifikan pada 6-jam dan menurun pada 16-jam. Kandungan protein naik secara signifikan setelah 2-jam, tetap stabil hingga 20-jam, dan kemudian menurun pada 24-jam. Tidak ditemukan korelasi antara kandungan protein dan pemeriksaan makroskopis (warna, konsistensi, bau, ukuran). Studi ini menekankan perubahan biologis dinamis dalam sampel tinja monyet selama 24 jam dan pentingnya menggunakan tinja segar untuk diagnosis yang akurat.

**Kata kunci:** analisis biologis, monyet ekor panjang, sampel feses, serial waktu



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# TIME-SERIES BIOLOGICAL ANALYSIS OF LONG-TAILED MACAQUE FECAL SAMPLES: FORENSIC

**BELINDA CHONG JIA YIE**

Undergraduate thesis  
as one of the requirements to obtain a degree of  
Bachelor of Veterinary Medicine  
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## FOREWORD

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I hope that this research will be useful for those in need and for the advancement of science.

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