

Impact of Short-term Aromatherapy and COVID-19 Pandemic on Stereotypic Behavior and Cortisol Concentration in Captive Big Cats

Bushra Nisar Khan

Institute of Zoology, University of the Punjab, Lahore-Pakistan

Bushra.zool@pu.edu.pk

ABSTRACT

This study addresses the critical question of how zoological gardens, as conservators of endangered wildlife, impact the physical and mental well-being of captive animals, with a focus on lions (*Panthera leo*) and tigers (*Panthera tigris*) in Zoo Safari Lahore. It investigates the efficacy of sensory enrichment strategies in mitigating stress-induced behaviors and physiological responses in these big cats. Utilizing the focal method for behavior monitoring across three phases—pre-pandemic, post-pandemic, and enrichment—each spanning 15 days for a total of 45 hours of observation, the study examined the normal passive, normal active, and stereotypic behaviors of 32 lions and 5 tigers. Enrichment interventions included the introduction of catnip and prey dung in enclosures. Cortisol levels were noninvasively measured using Enzyme-Linked Immunosorbent Assay (ELISA) from fecal samples to assess stress. Key findings revealed a significant decline in stereotypic behaviors and cortisol levels post-enrichment, indicating an enhancement in animal welfare. For instance, post-enrichment observations showed a notable decrease in stereotypic pacing in lions by 40% ($\pm 5\%$) and a reduction in cortisol levels by an average of 20% ($\pm 2\%$), showcasing the positive impact of sensory enrichment on captive big cat well-being. The study underscores the pivotal role of sensory enrichment in improving the quality of life for captive big cats by reducing stress-related behaviors and physiological markers of stress. These findings highlight the importance of implementing species-specific enrichment programs in zoos and similar conservation settings to promote the psychological and physical health of endangered species in captivity. The use of noninvasive methods like ELISA for monitoring stress further emphasizes the potential for ongoing welfare assessment without adding stress to the animals. This research contributes to a growing body of evidence advocating for enriched environments as a standard in captive animal management, encouraging a reevaluation of traditional practices in zoological settings.

Keywords: Zoological garden, lions, tigers, ELISA, cortisol level, behavior