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非洲象糞孕酮濃度與其生殖階段間之關係

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摘要：保護及繁衍瀕臨絶種動物，爲世界各國所極力倡導的工作。據文獻所載，非洲象(African elephant)之動情週期長，且在動物園中不易繁殖。本試驗之目的，即欲由測定非洲象之糞孕酮(fecal progesterone,fP4)濃度的變化，以探討其與生殖狀態變化關係之可行性。本試驗選用台北市立動物園中，健康情形良好，且年齡分別由5至9歲不等之非洲象，共計四頭。自民國79年5月起至80年5月止，每週採集糞樣一次，並將糞樣保存於－20℃中。俟分析時，先以甲醇、石油醚萃取後，再應用酵素免疫分析法(EIA)測定其孕酮含量。由試驗結果顯示，年齡最小的非洲象（NO.4:5歲齡）於80年4月前之試驗期間，其fP4濃度均維持在20～70ng/g之間，及至80年4月至5月期間，始顯著上升至230ng/g;顯示已開始進入發身階段。其中兩頭非洲象（No.2與No.3）於試驗開始不久後，fP4濃度即出現週期性變化,其動情週期爲14.5±0.6週。（n＝4）；濾泡期之fP4濃度爲20～70ng/g,而黃體期之fP4濃度則維持在130～200ng/g之間。另一頭母象（No.1）則處於孕階段，其懷孕早期之fP4濃度變化較大（100～400ng/g），而懷孕後期則維持在140ng/g左右，其濃度均較一般家畜者爲低。由此顯示，應用糞孕酮濃度變化的追蹤測定，可明白獲知非洲象的生殖狀態，而有利於繁殖管理工作之進行。

關鍵字：非洲象、糞孕酮、動情週期、懷孕、酵素免疫分析法

前言

據調查，1930年在非洲廣大草原上，大約有五百萬頭非洲象生存其間，而後受到獵取象牙及非洲人口暴增的壓力，至1989年只剩下60萬頭而已，即在60年之間，非洲象的數量遽減了90%(謝，1991)。於是1989年10月華盛頓公約（CITES）年度會議中，提案通過將非洲象列入瀕臨絶種的第一類保護名單中，除禁止捕殺外，更積極進行非洲象保育及繁殖的工作。

了解大象生殖週期對其保育工作極爲重要。早期由行爲觀察（Eisenberg et al.,1971; Jainudeen et al.,1971）、陰道細胞學檢查（Watson and D'Souza,1975）及尿液中動情素的測定（Ramsey et al.,1981）等資訊，誤以爲非洲象動情週期大約3週。近年來利用測

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MONITORING THE REPRODUCTIVE STATUS OF AFRICAN ELEPHANT *(Loxodonta africana)* IN CAPTIVITY BY MEANS OF FECAL PROGESTERONE DETERMINATION

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Abstract: Four elephants of unknown age and at different stages of reproduction were used. Their fecal samples were collected once a week for period of 13 months (May 1990-May 1991) and stored at -20℃ until assayed. The prog esterone concentrations in feces were measured by using an enzyme immuno assay after extration with an organic solvent. The results indicated varying stages of reproductive status including 1 pregnancy, 2 normal cycling animals and 1 animal run through puberty during the study. Elephant ♯ 1 was found to have consistantly high fecal progesterone (100-400ng/g) during the collection period, indicating pregnancy. This was later confirmed by a subsequent abortion. Elephant ♯ 2 and ♯ 3 were found to have fecal progesterone that fluctuated between 20-70 ng/g at the follicular phase and between 130-200 ng/g atthe luteal phase, indicating normal cycling. The oestrous cycle was determined to be 102± 10 days. Elephant ♯ 4 was the youngest. Her fecal progesterone levels were kept between 20-70 ng/g before April 1991 and risen to 150-230 ng/g in May 1991. Probably she experienced puberty. These findings revealed that the fecal progesterone levels of African elephants in captivity are much lower than most animals but still extremely useful for the monitoring of their reproductive status.

Key words: African Elephant, Fecal progesterone, Estrous cycle, Pregnancy Enzymeimmuno assay (EIA)

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