

# 台北市立動物園黑猩猩親緣關係 快速基因鑑定方法之研究

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**摘要:**本研究係以快速基因鑑定技術來進行黑猩猩親緣關係之深入研究,以避免近親交配,並進一步作為動物園圈養黑猩猩之管理與保育繁殖工作的依據。研究對象為台北市立動物園之 27 隻黑猩猩。並針對先前此方面研究之問題進行改進:一、採用快速基因分析技術,以螢光標記及毛細管自動灌膠電泳分析方法,取代傳統之放射性標記及平板膠電泳分析,不僅可增進分析的速度及準確度,並可避免因使用放射性物質所帶來操作上的不便及安全上的顧忌;二、曾有研究以針對人類親緣關係分析設計之 13 組引子進行類似分析時,無法鑑定出黑猩猩萊佩的親緣關係,且出現無法合理解釋之結果,在本研究中使用內含 6 組係針對黑猩猩所設計的 10 組引子已成功地分析出其父親應為首長;三、先前我們利用 PTGT211 等 12 組引子已初步分析出台北市立動物園內 20 隻黑猩猩彼此間的親緣關係,但第二代黑猩猩莎莉春仍無法判定,此一研究中應用前面一、二所述之新方法及引子,已成功確認莎莉春為首長的後代。目前本研究已完成園內現存黑猩猩彼此間的親緣關係的確立,並已建立一套適用於黑猩猩親緣關係分析之基因鑑定方法。

**關鍵字:**黑猩猩, 聚合-連鎖反應, 引子, 微衛星基因座, 基因型

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# Rapid Genetic Paternity Analysis of Chimpanzees at Taipei Zoo

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**Abstract :** To avoid mating between near relatives, this study was intended to determine detailed paternity of 27 chimpanzees at Taipei Zoo by genetic analysis. Results derived from this study could provide guidance for the management and breeding of chimpanzees at Taipei Zoo. In this study, some improvements have been made. First, the speed and accuracy of genetic analysis for the paternity determination of chimpanzees has been substantially increased by applying the modern tools, such as fluorescence labeling and capillary electrophoresis with the auto-refill gel, instead of using the traditional tools, such as radioactive labeling and slab gel electrophoresis with manual gel filling. Next, the previous related study using 13 primer sets designed for human paternity determination couldn't resolve the paternity of Chu-Pei and yielded some weird results that couldn't be rationalized. This study applying 10 primer sets, including 6 primer sets specifically designed for chimpanzee paternity determination, has successfully determined that Chu-Pei is the offspring of Hsiao-Chiang. Finally, our previous study using 12 primer sets has preliminarily determined the familial relationships of 21 chimpanzees at Taipei Zoo except Sha-Li-Chuen. This study using the above-mentioned new technique with new primer sets has successfully determined that Sha-Li-Chuen is the offspring of Hsiao-Chiang. In summary, the study has successfully determined the familial relationships of chimpanzees at Taipei Zoo and set up the method appropriate for the rapid genetic paternity analysis of chimpanzees.

**Key words:** chimpanzee, polymerase chain reaction, primer, microsatellite locus, and genotype.

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