白色念珠菌擬單倍體菌株特性之研究

Studies on the Characteristics of the Parahaploid Strains of Candida albicans

中文摘要

白色念珠菌（Candida albicans）是伺機性感染的真菌，也是人體真菌感染最常見的種類。它被視爲具擬有性世代的絕對雙倍體，生活史中未被發現有性世代，但最近研究顯示其具有擬有性世代之現象。本實驗選取了 31 個已知爲形態上獨特（包括 Pink，Long，Mycelium，Big，Fat…等形態）之菌株進行實驗，並以標準菌株 SC5314 爲二倍體控制組。先以 PCR 判定性別，可分成 a1、α1α2、a1/α1、a1/α2 及 a1/α1α2 等五種組合型。經 12 個月培養後，定期以流式細胞儀檢察其倍數體，發現此五種性別組合均有單倍體的菌株出現，可能修正 Janbon（1998，1999）等人所提出是否單倍體會自行二倍體化或成爲同型合子之假說。由以上結果亦顯示，除了 a 型（a1 交配型）及α型（α1α2 交配型）外，仍出現重組型（亦即 a1/α1、a1/α2 與 a1/α1α2），亦可能更正 a1 及α1α2 爲獨立連鎖基因（Interlocked alleles）之假說。另外，本研究發展出以藥物紙錠擴散法（Fluconazole disc diffusion method）作爲鑑定 a1 型單倍菌株之方法。

英文摘要

Candida albicans was considered to be an opportunistic infection, affecting individuals who were immune debilitated. Oral candidiasis is the most common fungal infection in dental practice, and is caused by C. albicans that are normally present in the endogenous flora. C. albicans is absolute diploid with no apparent sexual phase and haploid strain in nature. The recent studies described a parasexual cycle of C. albicans through which mating occured between the opposite diploid homozygotes (α/α x a/a). In present study, 31 strains derived from C. albicans SC5314 with distinct morphology including pink, long, mycelium, big or fat were selected and SC5314 was used as control. By PCR, we divided all strains into 5 combinations of mating type including a1、α1α2、a1/α1、a1/α2 and a1/α1α2. In the12-month subsequent culture period, we detected the ploidy of these strains with flow cytometer by an interval of 2 weeks. The haploid strains of these 5 mating types were found to be stable in haploid state and that is contradicted to the hypothesis of Janbon in 1998 as which the haploid strains tend to double the chromosome spontaneously to be homozygotes. Results from this study also showed that there were recombinant mating types (a1/α1、a1/α2 and a1/α1α2) besides a1 type and α1α2 type and this suggested a new hypothesis that the MTLa1 and MTLα1α2 alleles were not interlocked. In addition, a quick method to identify a1 mating type strains in the

present study was developed by repeating treatment of the strains to fluconazole disc on the PDA plate.