

Declaration

The work described in this thesis was carried out by me under the supervision of Dr. Sirimali Fernando, Prof L.P. Samaranayake and Prof. M. T. M. Jiffry and a report on this has not been submitted to any university for another degree.

Signature

A handwritten signature in blue ink, appearing to read 'M. T. M. Jiffry', is written over a dotted line.



Declaration by the supervisors

I/We certify that the above statement made by the candidate is true and this thesis is suitable for submission to the University for the purpose of evaluation.

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**THE PHENOTYPIC AND GENOTYPIC DIVERSITY OF ORAL *Candida albicans*
ISOLATES IN SRI LANKAN COHORTS OF VARYING AGE GROUPS**

By

Manjula Manoji Weerasekera

**Thesis submitted to the University of Sri Jayewardenepura for the award of the degree of
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ABSTRACT

Information on phenotypes and genotypes of *C. albicans* isolates obtained from Asian populations is sparse. Hence, the main aim was to determine the proportion of people colonized with *C. albicans* in their mouths, among children, adult and elderly volunteers selected from the Colombo district and to find out if there are any phenotypic and genotypic variations in *C. albicans* in three different age groups. We applied randomly amplified polymorphic DNA (RAPD) genetic typing technique, and a (commercially available) phenotyping technique for strain delineation of *C. albicans*.

A total of 120 healthy individuals in three different age groups (<6 years, 30-50 years and >70 years) were sampled by oral rinse method. Twenty-nine isolates of *C. albicans* were identified by Gram staining, 'germ tube' and API 20CAUX test. Biotypes were determined using their ability to assimilate a variety of different sugars, and their resistance to boric acid. For genotyping, DNA was extracted and fingerprinted with the RAPD technique using two random primers. This technique is versatile, simple and reproducible and has been previously used for typing candida.

Forty one percent of the volunteers carried yeast in their mouths. The proportion of *C. albicans* carriage was greater (23%) than that for other *Candida* species. There was a significant difference ($p < 0.01$) between the recovery rate of yeast and *C. albicans* within the three age groups.

On biotyping, 7 types were identified while RAPD analyses revealed 10 different genotypes. When the genotyping and the biotyping profiles were combined, a total of 18 composite types emerged.

Both the RAPD and the phenotyping system we have established to type *C. albicans* yielded reproducible results. Further investigation using the above methods and other epidemiologic typing techniques will be necessary to enhance the understanding of the epidemiology and pathogenesis of candidiasis.

CHAPTER 1

**THE PHENOTYPIC AND GENOTYPIC
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