

# CHARACTERISATION OF CANDIDA SPECIES IN CHILDREN WITH AND WITHOUT ECC

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## INTRODUCTION

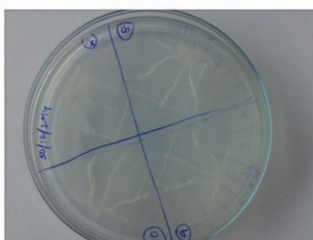
Early childhood caries (ECC) is a destructive form of tooth decay that afflicts young children. Although mutans streptococci is frequently associated with the carious lesion, the presence of other microorganisms such as *Candida* is found to enhance its pathogenicity. There are many species of *Candida*, of which *C. albicans* is the most prevalent one recovered from the oral cavity. However, there is due attention needed for non albicans *Candida* (NAC) due to their enhanced resistance. Therefore identification of infecting strains of *Candida* is important because isolates of *Candida* species differ widely in their ability to cause infection. The present study was undertaken to characterize the virulence of different *Candida* species in ECC and to compare its existence as a normal commensal in the oral cavity of non ECC individuals.

## MATERIALS AND METHODS

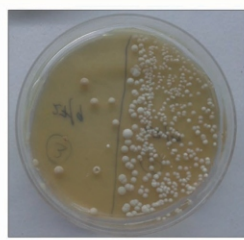
100 Children below 6 years of age were categorized into ECC and non ECC groups of fifty children each. Samples were collected from the buccal, lingual, proximal, and cervical portions of the tooth using sterile cotton swab, inoculated on Sabouraud's Dextrose Agar and incubated at 37°C for 24 hr. Isolates were speciated based on the conventional methods of germ tube testing and Dalmau plate culture on corn meal agar. The samples were also streaked on HiCrome Agar media and incubated at 37°C for 24 hr. Colonies were identified depending on their color and pattern of growth. The virulence markers such as hemolysin, phospholipase, and germ tube formation were tested on all *Candida* isolates. The data were statistically analyzed using "Chi square test," "Mann-Whitney U test," and "Fisher exact test" in SPSS Version 17.0. The results were considered statistically significant at  $P < 0.05$ .

## RESULTS

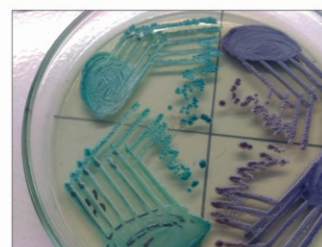
Candidal carriage among the ECC group was found to be 84%, whereas 24% in non ECC group is statistically significant (Figure 1). The species distribution of *Candida* found in the ECC group and non ECC group is shown in Table 1. Phospholipase production showed a statistically significant difference among the ECC and non ECC groups. The other virulence factors tested such as hemolysin and germ tube formation showed no statistically significant difference among the groups as shown in Table 2.



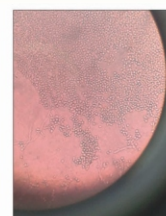
Dalmau plate culture on corn meal agar



Growth of *Candida* on Sabouraud's Dextrose Agar



Candidal colonies on HiCrome Agar



Chlamydospore formation of *Candida albicans* - microscopic

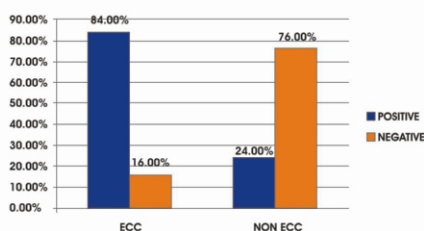


Figure 1: The growth of *Candida* on Sabouraud's Dextrose Agar

Table 1  
Comparison of species distribution of *Candida* among early childhood caries and non-early childhood caries groups

Species	Frequency (1%)		P*
	ECC	Non ECC	
<i>Candida albicans</i>	25(59.5)	8(66.7)	0.6804
<i>Candida glabrata</i>	3(7.1)	0	NA
<i>Candida guilliermondii</i>	1(2.4)	1(8.3)	0.4444
<i>Candida krusei</i>	5(11.9)	1(8.3)	0.8015
<i>Candida kyfer</i>	1(2.4)	1(8.3)	0.4444
<i>Candida tropicalis</i>	7(16.7)	1(8.3)	0.538
Total	42(100.0)	12(100.0)	

\*Fisher's exact test. ECC=Early childhood caries; NA=Not available

Table 2  
Comparison of virulence factors of *Candida* among early childhood caries and non-early childhood caries group

Virulence test	ECC Group (1%)	None-ECC group (1%)	P
Phospholipase test			
Positive	39(92.8)	0	<0.001*
Negative	3(7.14)	12(100)	
Total	42(100)	12(100)	
Hemolysin test			
Positive	25(59.5)	5(41.66)	<0.441**
Negative	17(40.47)	7(58.33)	
Total	42(100)	12(100)	
Germ tube and hyphal formation			
Positive	25(59.5)	8(66.7)	<0.462**
Negative	17(40.47)	4(33.3)	
Total	42(100)	12(100)	

\*Statistically significant using Fisher's exact.

\*\*Statistically not significant using Chi-square test. ECC=Early childhood caries

## DISCUSSION

*C. albicans* showed the highest prevalence among the candidal isolates. This may be due to its capacity to form germ tubes facilitating adhesion. However, the presence of significant amount of NAC such as *C. glabrata*, *C. guilliermondii*, *C. krusei*, *C. kyfer*, *C. tropicalis* could be appreciated in our study. In the present study, virulence factors such as formation of germ tubes, hyphae, hydrolytic enzymes such as phospholipases and hemolysin were expressed by the *Candida* species which denotes their pathogenicity. The candidal isolates of ECC group showed phospholipase production whereas it was absent in the non ECC group. Phospholipase acts by degrading the cell membrane of tissues and epithelial cells, and its presence among the isolates of ECC group alone may suggest its role in the pathogenicity.

## CONCLUSION

The current study substantiates previous evidence of the association between candidal carriage and dental caries. In addition to *C. albicans*, NAC also can be considered to be a major pathogen associated with ECC.

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## REFERENCES

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