Name of the Ph.D. Scholar : **Deepa Anil Kumar**
Name of the Supervisor : **Prof. Luqman Ahmad Khan**
Name of the Co-Supervisor : **Prof. Seemi Farhat Basir**
Name of the Co-Supervisor : **Prof. Uma Banerjee**
Name of the Department : **Dept. of Biosciences, Jamia Millia Islamia, New Delhi.**
Title of the Thesis : **Spectrum of Candida species in Health and Oral Lesions.**

Development of immunosuppressive therapies, organ transplantation, invasive surgical procedures and Human Immunodeficiency Virus (HIV) infection, has resulted in resurgence of fungal infections. Recent past has witnessed emergence of pathogens other than well established opportunists like *Candida albicans, Cryptococcus neoformans* and *Aspergillus fumigatus*. Among these are various members of non *Candida albicans Candida* (NCAC) such as *C. glabrata, C. tropicalis, C. parapsilosis, C. krusei, C. dubliniensis, C. guilliermondii, C. lusitianae, C. rugosa, C. nivariensis and C. haemulonii.* This study was designed to get an insight into present scenario of spectrum of *Candida* species in Healthy, HIV seropositive, diabetes and periodontal disease patients. Identification has been done up to species level, *in vitro* antifungal resistance patterns has been investigated against amphotericin-B, fluconazole, ketoconazole, itraconazole and voriconazole. Proteinases and phospholipase secretion, and biofilm formation by various isolates from healthy and diseased groups has been investigated. The study protocol was approved by institutional ethics committee [(No. 26-11-EC (21/31)] and specimens were collected at outpatient departments (OPD) after obtaining informed consent from each subject. Growth was done on SDA slants, Corn meal-Tween-80 agar, Chrom Agar and Tween-80 opacity test medium. Morphotyping was done by Grams stain and carbohydrate assimilation test. Resistotyping was done by E-test. Proteinase and phospholipase secretion, biofilm and germ tube formation was investigated by

standard protocols. $CD4^+$ T-cells count was performed using BD FACS Count System, USA.

Out of 100 **HIV seropositive** individuals studied, 48% were positive for oral yeast carriage. Thirty nine specimens yielded single species and nine yielded more than one species, giving a total of 58 isolates. Predominant species isolated was *C. albicans* (57%). Among NCAC, *C. tropicalis* and *C. krusei* were frequently isolated. Unusual yeasts such as *Saccharomyces cerevisiae* and *Geotrichum candidum* were also seen. Oral carriage of opportunistic pathogenic yeasts was greater in HIV seropositive persons heading towards an immunocompromised state, as evidenced by their $CD4^+$ cell count. Out of 100 **diabetic patients** screened, 42% were positive for oral yeast carriage. Thirty five swabs yielded single species, 2 yielded three different species and 5 yielded two different species and seven yielded two or more species, giving a total of 51 isolates. Predominant species isolated was *C. albicans* (51%). NCAC species accounted for 47%. *C. tropicalis* (15%) and *C. krusei* (14%) showed predominance over the other NCAC isolates. Some rare species like *C. magnoliae* and *Trichosporon asahii* were also isolated in the present study. A positive correlation was seen between oral yeast carriage in relation with fasting blood sugar level and duration of diabetes. Out of 52 patients with **periodontal lesion**, 21% yielded various *Candida* species. *C. albicans* (83%) was the commonest species isolated, and NCAC species accounted for 17%. *In vitro* antifungal susceptibility test revealed none of the *C. albicans* isolates, both from diseased and control group, were resistant to any of the antifungal agents tested. While 100% resistance was observed in *C. krusei* isolates, three isolates of *C. glabrata* and one isolate each of *C. magnoliae, C. rugosa and T. asahii* showed dose dependent susceptibility. Proteinase and phospholipase secretion was higher in isolates from HIV and diabetic groups but not in periodontal group. Percentage of isolates forming biofilm was higher in the diseased group.