

**Mycological Investigation of Sputum Samples from Pulmonary  
Tuberculosis Patients Attending Mbagathi District Hospital TB Clinic,  
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**A thesis submitted in partial fulfillment for the degree of Master of  
Science in Medical Mycology in the Jomo Kenyatta University of  
Agriculture and Technology.**

**2011**

## ABSTRACT

Fungal co-infection with *Mycobacterium tuberculosis* is most likely because most of the pulmonary tuberculosis patients are co-infected with HIV/AIDS making them highly immunocompromised with high risk of acquiring opportunistic fungal pathogens. The study objective was to determine fungal pathogens co-infection with *Mycobacterium tuberculosis* in patients attending Mbagathi District Hospital Tuberculosis reference laboratory. One hundred and seventy two samples of sputum from the patients having pulmonary tuberculosis were subjected to mycological investigations for fungal pathogens like *Pneumocystis jirovecii*, *Cryptococcus* spp., *Candida* spp., *Aspergillus* spp. and other systemic fungal pathogens. The study was done using samples from confirmed tuberculosis patients at Mbagathi District Hospital. First morning expectorate sputum samples intended for mycobacteriological investigations were subjected to mycological investigation using microscopy and culture. From this study the results showed that adults were much infected with pulmonary tuberculosis than children. It was indicated that males were more infected with pulmonary tuberculosis than the females. The study indicated that *Mycobacterium tuberculosis* co-infect with yeasts as indicated in the following results: Among the 46 yeasts isolates 33 (19.2%) were *Candida albicans*, 3 (1.7%) were *Candida dubliensis*, 1 (0.6%) was *Candida guilliermondii*, 3 (1.7%) were *Candida tropicalis*, 2 (1.2%) were *Cryptococcus lauretii*. 126 samples (73.3%) were negative for yeasts. From the study, *Candida albicans* were the most predominant yeasts that co-infected with *Mycobacterium tuberculosis*.

*Mycobacterium tuberculosis* also co-infected with the fungi in form of mold as shown in the following results: Among the samples involved 2 organisms (1.2%) were identified as *Aspergillus flavus* 3 (1.7%) were *Aspergillus fumigatus*, 4 (2.3%) were isolated as *Aspergillus*

*niger*, 2 (1.2%) were *Scytalidium hyalinum*, 4 (2.3%) were isolated as *Trichosporon asahii*. 157 samples (91.3%) were negative for molds. *Aspergillus niger* and *Trichosporon asahii* were the most predominant molds that co-infected with *Mycobacterium tuberculosis*. *Pneumocystis jirovecii* were also isolated from the sputum samples and all the 172 samples were subjected to Toluidine Blue 0 for the detection of the *Pneumocystis jirovecii* and a total of 19 samples (11.0%) positive for *Pneumocystis jirovecii* and a total of 153 samples (89%) were negative for *Pneumocystis jirovecii*. Bacteria were also isolated from the sputum samples as follows: 4 bacteria (2.3%) were isolated as Gram negative rods, 10 (5.8%) were Gram positive cocci, 6 (3.5%) were isolated as Gram positive rods. 152 samples (88.4%) were negative for bacteria. Male adults were more susceptible to pulmonary tuberculosis than females or children with prevalence of 59.9%. The most predominant yeasts that co-infected with pulmonary tuberculosis were the *Candida albicans* with a prevalence of 19.2%. This was due to the fact that *Candida albicans* are normal flora of respiratory system. In this study there was significant co-infection of yeasts with *Mycobacterium tuberculosis* with a chi-square p-value of 0.02. According to this study, there was no significant co-infection of molds and *Pneumocystis jirovecii* with *Mycobacterium tuberculosis* after calculation of chi-square p-values of 0.28 and 0.86 respectively.