

Antimicrobial activity of different homoeopathic drugs and their potencies against '*Aspergillus niger*' *In vitro*

Suneel Prajapati^{1*}, Mahima Sharma¹, Arun Kumar¹, Pankaj Gupta¹, Binit Dwivedi¹, Bhopal Singh Arya¹, Renu Arya², Debadatta Nayak²

¹Dr. D.P. Rastogi Central Research Institute for Homoeopathy, Noida, Uttar Pradesh, ²Central Council For Research in Homoeopathy, Janakpuri, New Delhi, India

Abstract

Background: Homoeopathic remedies are widely used all over the world for different disease conditions. Approximately 70% are derived from the plant; however, their preclinical evaluation is still a major concern. **Objective:** This study was undertaken with an aim to explore the antimicrobial effect of different homoeopathic drugs and its potencies against the *Aspergillus niger*. **Materials and Methods:** Fifteen homoeopathic mother tinctures (Θ) and their potencies (3x, 6x, 12x) were tested for their biological activity against the human pathogenic fungi *A. niger* using disc diffusion method according to clinical and laboratory standard (CL.SIM44-A) with slight modifications. The diameter of zone of inhibition was measured and compared with vehicle control (Alcohol 90%). The experiment was performed twice to check the reproducibility. **Results:** The marked antifungal activity was observed with Θ of *Zingiber officinale*; the growth of *A. niger* was inhibited and showed maximum zone of inhibition up to 15.4 ± 2.88 mm followed by *Holarrhena antidiysenterica* (13.2 ± 1.09) and *Terminalia chebula* (10.6 ± 1.14). Different potencies (3x, 6x and 12x) were also exhibited significant zone of inhibition, especially *Allium cepa* 6x (10.4 ± 0.89), *Caesalpinia bonducella* 6x and 12x (12.8 ± 0.54 and 10.4 ± 1.14, respectively), *Eucalyptus globulus* 12x (11.3 ± 1.94), *Ruta graveolens* 12x (15.0 ± 2.23), *Thuja occidentalis* 6x (10.8 ± 0.83), and *Zingiber officinale* 3x and 6x (13.0 ± 2.73 and 11.4 ± 2.30, respectively) as compared to control. **Conclusion:** The findings of study concluded that Θ and potencies can effectively inhibit the growth of *A. niger in vitro*. This study paves the way for development of homoeopathic antifungal treatments. However, further investigations are required to get more information about the mechanistic approach, their mode of action and *in vivo* evaluation.

Keywords: Antifungal, *Aspergillus niger*, Disc diffusion, Homoeopathic drugs, *In vitro*

INTRODUCTION

Aspergillus is airborne fungus and can cause allergy as well as invasive infection worldwide. Moulds with highest toxicity come from the *Aspergillus* genus and are considered as highly pathogenic for humans. Although since ancient time, it was thought that Invasive Aspergillosis (IA) is caused by *Aspergillus fumigatus*.^[1] later on it was reported that the emergence of IA can be caused by non-fumigatus species such as: *A. flavus*, *A. ochraceus*, *A. niger*, *A. versicolor* or *A. terreus*.^[2,3] *Aspergillus* species also are saprophytic, thermo tolerant fungi which are ubiquitous in the air and environment. There are 185 species of genus *Aspergillus* reported, and out of these, 20 can cause human infections. *Aspergillus fumigatus* is the most common species found in human infections all over the world.^[4,5] The incidence of *A. niger* complex IA has been found to be 0.048% in organ transplantation patients and 0.16% in stem cell transplant recipients.^[6,7] Although humans inhale *Aspergillus* spores at the rate of hundreds per day, they

rarely experience complications. However, under special circumstances, *Aspergillus* species has ability to produce spectrum of diseases involving lungs and later on other organs and tissues.^[5]

Aspergillosis infections can also strike as sinus disease in immunocompromised hosts. If left untreated, IA can have mortality approaching 100%. In cases of suspected IA, an extensive diagnostic workup is necessary, but treatment should be initiated early to reduce morbidity and mortality.^[8-10] Over the past two decades, emergence of such saprophytic fungi

***Address for correspondence:** Mr. Suneel Prajapati,
Dr. D.P. Rastogi-Central Research Institute for Homoeopathy,
Noida - 201 301, Uttar Pradesh, India.
E-mail: saimpj@gmail.com

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