



## IN VITRO EVALUATION OF ANTI MYCOTIC ACTIVITY OF ZINGIBER OFFICINALE EXTRACT ON CANDIDA ALBICANS

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### ABSTRACT

**Introduction:** An anti mycotic is a substance that kills or inhibits the growth of fungi. *Zingiberofficinale* has been valued as a zesty spice and a reliable medicinal herb for centuries. It has various herbal actions. The medicinal uses of ginger have been known for at least 2,000 years in cultures all around the world. It is a flavouring agent in beer, soft drinks, candies, and a staple spice. Effect of *Zingiberofficinale* extract on *Candida albicans* is determined.

**Aim:** To evaluate the antimycotic activity of *Zingiberofficinale* extract on *Candida albicans*.

**Methodology:** The antimycotic activity is carried out by agar well diffusion technique against the fungal pathogens and the zone of inhibition is measured in mm diameter.

**Result:** In the present study, *Zingiberofficinale* was found to be effective against gram-positive *Candida albicans* organisms tested.

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### INTRODUCTION

Infectious diseases are the major cause for health problems in developing countries like India<sup>[1]</sup>. Medicinal plants represents a rich source of antimicrobial agents. Plants are used medicinally in different countries and are the resource of many potent and powerful drugs<sup>[2]</sup>. Plant herbs are naturally gifted at the synthesis of medicinal compounds. The use of herbs to treat disease is almost universal and is often more affordable than expensive modern pharmaceuticals. Many of the phytochemicals found in the herbs have beneficial effects and can be used to treat human diseases<sup>[3]</sup>. The extraction and characterisation of bioactive compounds from medicinal plants have resulted in the discovery of new drugs with high therapeutic value<sup>[4]</sup>. *Zingiberofficinale* (commonly called as ginger) has many uses. Ginger belongs to Zingiberaceae family. The Zingiberaceous plants are characterised by their tuberous or non tuberous rhizomes which have strong aromatic and medicinal properties. Traditional uses of plants have led to investigating their bioactive compounds which have resulted in the detection of a significant number of therapeutic properties<sup>[5,6]</sup>. In traditional Indian medicine or Ayurveda *Zingiberofficinale* and many other herbs have been used as medicine<sup>[7]</sup>. Medicinal plants has been used in different application especially to treat different pathogenesis of microorganisms in the world. The pathogenic include yeast such as *Candida* is resistance to several drugs like

cycloheximide, fluconazole, nystatin and griseofulvin this resistance was increased in recent years because of several mechanisms developed like genetic changes in some genes through mutations that cause changes in some enzyme pathway<sup>[8]</sup>. In the past few decades a worldwide increase in the incidence of fungal infections has been observed. The majority of anti fungal drugs used clinically have many drawbacks like toxicity, efficacy and cosy and their frequent use led to resistance strain<sup>[9]</sup>. *Candida* is a normal commensal of the oral cavity. However in immunocompromised individuals candidiasis is the earliest infection to manifest<sup>[10]</sup>. Recently many plant extracts have shown to have therapeutic values with respect to oral diseases<sup>[11,12,13]</sup>. The present study was carried out to assess the effect of *Zingiberofficinale* extract against *Candida albicans* in vitro.

### MATERIAL AND METHODS

#### Materials

The Bacterial strains used was *Candida albicans*. The organisms was obtained from Department of Microbiology, Saveetha Dental College and Hospitals.

#### Methodology

The *Zingiberofficinale* powder was dissolved in distilled water in following concentrations 2.5mg/ml, 5mg/ml and 10mg/ml so that 100µl delivers 250µg/ml, 500µg/ml and 1000 µg/ml respectively.

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### Agar well diffusion technique

Broth culture of the test organisms compared to Mac Farland's standard 0.5 were prepared. Lawn culture of the test organisms were made on the Muller-Hinton agar [MHA-M1084] plates using sterile cotton swab and the plates were dried for 15 minutes. Well measuring 4 mm depth was made on the agar with sterile cork borer. 100µl of the extract was added to the wells. The plates were incubated overnight and the zone of inhibition of growth was measured in mm diameter. All the test were done in triplicate to minimise the test error.

### RESULT

The antimycotic activity of the ginger extract at different concentrations was screened by agar well diffusion technique and the zone of inhibition was measured in mm diameter. The results are given in the table 1. The activity of *Zingiberofficinale* extract was compared with the control. Different concentrations (250µg/ml, 500µg/ml, 1000µg/ml) of extract were used and the zone of inhibition was measured. When the concentration is 250µg/ml the inhibition was found to be 20mm diameter. Similarly for 500µg/ml and 1000µg/ml it was found to be 26 and 29mm diameter and for the control it is 22mm diameter. The result shows that as the concentration of the extract increases the zone of inhibition also increases.

### DISCUSSION

There are various uses of Ginger which includes anti emetic activity, anti ulcer, anti-platelet, antipyretic, anti inflammatory and antioxidant activity. Ginger has various phytochemicals like gingerols, zingibain, bisabolene, oleoresins, starch. The use of phytochemicals derived from plants, with known antimicrobial properties, are of great significance to medicinal treatments. Ginger extract containing Gingerol inhibits the growth of many bacteria and fungi in-vitro and the activity might be contributed to the preventive effects of its different agents.

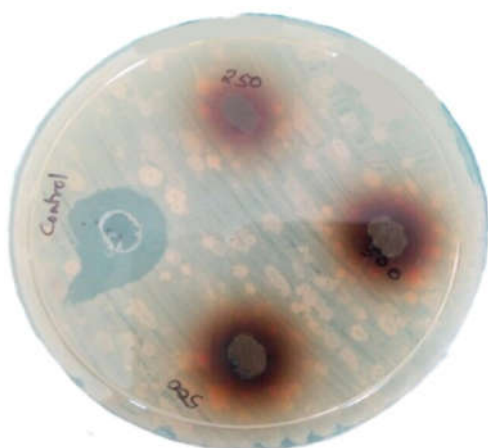
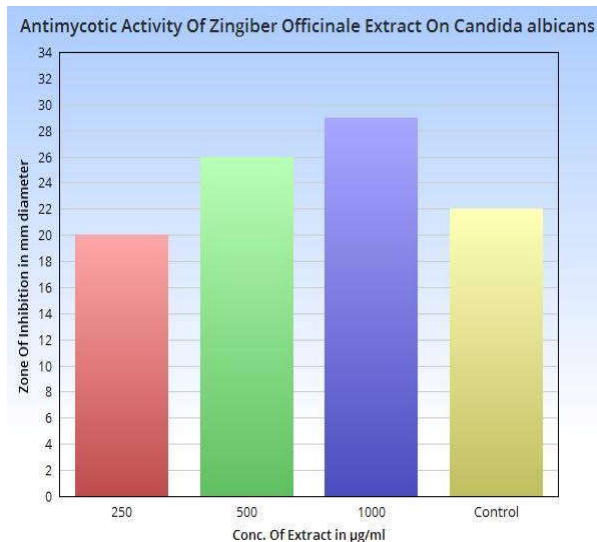


Figure 1

(Figure showing antimycotic activity of *candida albicans* by using agar well diffusion method)

Table 1 Antimycotic activity of *Zingiberofficinale*

Conc of Extract µg/ml	Zone of Inhibition mm diameter
250	20
500	26
1000	29
Control	22



### CONCLUSION

The results of this study suggest good correlation between medicinal use and the in vitro antimycotic activity. It has been concluded from present study that certain plant extracts are a source of cheap and effective fungicides of ginger extract and also it doesn't have human and environment health implications. The results of our present study shows the extract used have significant antibacterial action on the bacterial agents tested.

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