# BIOCHEMICAL STUDIES ON THE MODE OF ACTION OF SOME ANTIMICROBIAL AGENTS

*Thesis Submitted to the faculty of science*
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*By*

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# ABSTRACT

The present study was carried out to search for some new antimicrobial and antifungal agents against broad-spectrum microorganisms and to show the probable mechanism through which the most potent derivative exerts its action on the test organism. From screening program, 2-amino-4,6-dimethyl pyridine derivative of 5-nitro-2-thiophene carboxaldehyde given the abbreviated names DMNP exerting a pronounced antifungal activity against *Candida albicans.* Results of this study clearly indicated that, the target for action of DMNP is the cell membrane which causes its damage by the inhibition of ergosterol (the major sterol of fungi) biosynthesis. Moreover, DMNP cause also disturbance in fatty acid metabolism whish may accumulate in oil droplets. In addition, DMNP strongly curtailed the synthesis of *Candida albicans* soluble phosphorus, RNA, DNA besides a cytoplasmic pool target, protein synthesis.

*This Thesis Has Not Been Submitted To This or Any Other University*

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# *CONTENTS*

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# LIST OF FIGURES

# LIST OF TABLES

# LIST OF PHOTOS

# ABBREVIATIONS

| | | |
|---|---|---|
| $A^o$ | : | Angstrom |
| ATP | : | Adenosine Tri Phosphate |
| A. niger | : | *Aspergillus niger* |
| b. p. | : | boiling point |
| *B. subtilis* | : | *Bacillus subtilis* |
| C | | Cytosine |
| *C. albicans* | : | *Candida albicans* |
| Cpd | : | Compound |
| DMSO | : | Dimethyl sulphoxide |
| DMNP | : | 2,4 dimethyl-5-N(2-methyl-5-nitrothiofyl)-pyridine |
| DNA | : | Deoxyribonucleic acid |
| *E. coli* | : | *Escherichia coli* |
| G | : | Guanine |
| GC | : | Gas Chromatography |
| GLC | : | Gas Liquid Chromatography |
| HIV | : | Human Immunodeficiency Virus |
| HPLC | : | Highly Performance Liquid Chromatography |
| I. R. | : | Infrared |
| M | : | Molar |
| MIC | : | Minimum inhibitory concentration |
| mM | : | Millimolar |
| Mol. W. | : | Molecular weight |
| mRNA | : | Messenger ribonucleic acid |
| ng | : | nanogram |
| nm | : | nanometer |
| No | : | Number |
| NTC | : | 5-nitro-2-thiophene carboxaldehyde |
| O. D. | : | Optical density |