

Table of Contents

الآية	I
Dedication	II
Acknowledgment	III
Abstract (English)	IV
Abstract (Arabic)	V
Table of Contents	VI
List of Figures	IX
1. CHAPTER ONE: Introduction and Objectives	1
1.1 Introduction	1
1.2 Rationale	3
1.3 Objectives	3
2. Chapter TWO: LITERATURE REVIEW	4
2.1 <i>Mycobacterium tuberculosis</i>	4
2.1.1 Taxonomy of <i>Mycobacterium</i>	4
2.1.2 Microscopic morphology	6
2.1.3 Cell wall structure	7
2.1.4 Nutritional and environmental requirements for growth	8
2.1.5 Generation time	11
2.1.6 Epidemiology	12
2.1.6.1 Epidemiology of TB among HIV patients	13
2.1.6.2 Epidemiology of Multidrug-resistant TB	13
2.1.7 Physiology	14
2.1.8 Virulence	14
2.1.9 Pathology	15
2.1.9.1 Clinical features	16
2.1.9.2 Miliary tuberculosis	17
2.1.9.3 Adult Post-Primary Pulmonary Tuberculosis	18
2.1.10 Diagnosis	18
2.1.10.1 Conventional Diagnostic Methods	18
2.1.10.1.1 Microscopic Techniques	18
2.1.10.1.2 Traditional Culture Techniques	19
2.1.10.1.3 Biochemical Tests and Morphological Features	20
2.1.10.2 New Diagnostic Methods	21
2.1.10.2.1 Polymerase chain reaction	2

	1
2.1.11 Treatment	22
2.1.12 Prevention	22
3. CHAPTER THREE: MATERIALS AND METHODS	24
3.1 Study Design	24
3.1.1. Type of The Study	24
3.1.2. Study Area	24
3.1.3. Study Population	24
3.1.4. Data Collection	24
3.2 Asepsis and sterilization	24
3.2.1 Flaming	24
3.2.2 Red Heat	24
3.2.3 Hot air oven	24
3.2.4 Moist Heat (autoclaving)	25
3.2.5 Disinfection	25
3.3 Method of sample collection	25
3.4 Ziehl Neelsen stain	25
3.5 Decontamination of Sputum	25
3.6 Preparation of Lowenstein Jensen medium	26
3.7 Culture Method	26
3.8 Identification of Isolate	27
3.8.1 Growth Rate	27
3.8.2 Pigment Production	27
3.9 Catalase Test	27
3.10 Nitrate Reduction Test	28
3.11 Sensitivity to Para – Nitrobenzoic Acid (PNB) 500 mg / L	28
3.12 Sensitivity to Thiophene - 2 -Carboxylic Acid HYDROZIDE (TCH) 5 mg / L	28
3.13 Molecular Identification (PCR)	28
3.13.1 DNA Extraction From Cultures	28
3.13.2 Primers of Insertion Sequence <i>IS6110</i>	29
3.13.3 Preparation of PCR Mixture	29
3.13.4 PCR amplification	29
3.13.5 Preparation of agarose gel	30
3.13.6 Visualization of PCR Product	30
4. CHAPTER FOUR: RESULTS	31
4.1Bacteriological findings	31
4.1.1 Isolation	31

4.1.2 Growth rate	31
4.1.3 Ziehl-Neelsen staining	31
4.1.4 Cultural characteristics	31
4.1.5 Biochemical tests	32
4.2 Polymerase chain reaction	32
4.2.1 Amplification of the <i>IS6110</i> target gene	32
5. CHAPTER FIVE: DISCUSSION	37
6. CHAPTER SIX: CONCLUSION and RECOMMENDATIONS	39
6.1 CONCLUSION	39
6.2 RECOMMENDATIONS	40
REFERENCES	41
APPENDICES	45
APPENDIX I Z.N. staining	45
APPENDIX II Decontamination Of Sputum	45
APPENDIX III Catalase Test	46
APPENDIX IV Nitrate Reduction Test	47
APPENDIX V Sensitivity To (PNB) 500 mg / l	47
APPENDIX VI Sensitivity To (TCH) 5 mg / l	48
APPENDIX VII PCR Reagents and Equipments	48
APPENDIX VIII Results	49
Results of DNA amplification by PCR	49
Results of Identification of Isolates	51

List of Figures

figure No (1) growth of <i>M. tuberculosis</i> on LJ medium	33
figure (2) acid fast bacilli using ZN stain	43
figure (3) results of Catalase test	34
figure (4) results of nitrate reduction test	34
figure (5) results of DNA amplification by PCR	35
figure (6) results of DNA amplification by PCR	35
figure (7) results of DNA amplification by PCR	36
figure (8) results of DNA amplification by PCR	36