LIST OF FIGURES

2.1 Xylan structure and the sites of its attack by microbial xylanolytic enzymes 8

2.2 The xylanolytic system . 26

4.1 Xylanase activity of cultures isolated from the garbage dump 70

4.2 Temperature and pH optima of crude supernatant of Bacillus circulans AB 16 77

4.3 Effect of temperature on xylanase production in Bacillus circulans AB 16 92

4.4 Effect of pH on xylanase production in Bacillus circulans AB 16 93

4.5 Induction of xylanase synthesis during growth of Bacillus circulans AB 16 on xylan 94

4.6 Induction of xylanase synthesis during growth of Bacillus circulans AB 16 on rice straw 95

4.7 Elution profile of xylanase of Bacillus circulans AB 16 from Q Sepharose 97

4.8 Elution profile of xylanase component I from Sepharose 6 B 98

4.9 Effect of pH on purified xylanase components of Bacillus circulans AB 16 103

4.10 Effect of temperature on purified xylanase components of Bacillus circulans AB 16 104

4.11 Thermal stability of purified xylanase components of Bacillus circulans AB 16 105

4.12 Restriction map of the recombinant plasmid pAD2 112

4.13 Optimum pH of xylanase from E. coli with pAD21 . 116

4.14 Temperature optima of xylanase from E. coli with pAD21 117

4.15 Induction of xylanase synthesis during growth of Bacillus circulans AB 16 in modified medium 128

4.16 Induction of xylanase synthesis during growth of
Bacillus circulans AB 16 in modified medium in a 3 liter fermenter

4.17 Enzymatic hydrolysis of agricultural residues and municipal solid waste

xii