

CONTENTS

<u>Chapter</u>	<u>Page Number</u>
INTRODUCTION	1
REVIEW OF LITERATURE	8
MATERIALS AND METHODS	47
Media used	47
Reagents	53
Reference Strains	58
Methodology	59
Survey	59
Collection of samples	59
Microbiological analysis	60
Phenotypic characterization of Bacilli	61
Identification	67
Molecular characterization of Bacilli	67
Phenotypic characterization of LAB	72
Identification of LAB	77
Characterization of yeast isolates	78
Identification of yeast	81
Pathogenic contaminants	81

Technological properties of Isolates	83
Acidification and coagulation	83
Amylolytic activity	83
Proteolytic activity	84
α -amylase activity assay	84
Protease activity assay	85
Enzymatic profile by API-zym	86
Phytic acid degradation	87
Degradation of oligosaccharides	87
Antimicrobial and bacteriocin activity	88
Agar Spot Test	88
Bacteriocin activity	88
Biogenic amine	89
Hydrophobicity assay	90
Screening of PGA production	90
Degradation of PGA	91
Antioxidant activity and Total phenol content	92
Testing of strain(s) for <i>turangbai</i> and <i>bekang</i> preparation	95
Starter culture(s) preparation	95

Laboratory-scale preparation of <i>turangbai</i>	
and <i>bekang</i>	96
Sensory evaluation	97
Statistical analysis	98
RESULTS	99
Survey and documentation	99
Microbial population	109
Phenotypic identification of <i>Bacillus</i> spp.	
from <i>turangbai</i>	115
Phenotypic identification of <i>Bacillus</i> spp.	
from <i>bekang</i>	138
Genotypic identification of <i>Bacillus</i> spp.	160
Characteristics and identification of LAB	
from <i>turangbai</i>	183
Characteristics and identification of LAB	
from <i>bekang</i>	193
Characteristics and identification of yeasts	
from <i>turangbai</i>	204
Characteristics and identification of yeasts	
from <i>bekang</i>	211
Prevalance of microorganism in <i>turangbai</i>	217
Prevalance of microorganism in <i>bekang</i>	235

Occurrence of pathogenic bacteria in <i>turangbai</i> and <i>bekang</i>	255
Technological properties	259
Amylolytic and proteolytic activities of <i>Bacillus</i> and LAB from <i>turangbai</i>	259
Amylolytic and proteolytic activities of <i>Bacillus</i> and LAB from <i>bekang</i>	262
Enzymatic profiles	265
PGA- production by <i>Bacillus</i> spp. of <i>turangbai</i> and <i>bekang</i>	268
Degradation of PGA by LAB strains	272
Acidification and coagulation activities	275
Antimicrobial activities	280
Bacteriocin assay	286
Screening of Biogenic amines-producing LAB	290
Hydrophobicity of the LAB strains	295
Degradation of antinutritive factors	301
Antioxidant capacity and total phenol content	308
Starter culture preparation	312

Sensory evaluation of <i>turangbai</i> and <i>bekang</i> prepared by starter culture(s)	313
DISCUSSION	317
Documentation of traditional knowledge	317
Phenotypic identification of <i>Bacillus</i> spp.	319
Genotypic identification of <i>Bacillus</i> spp.	320
Identification of LAB	325
Identification of yeasts	326
Prevalance of microorganisms	327
Occurrence of pathogenic bacteria in <i>turangbai</i> and <i>bekang</i>	329
Technological properties	330
Amylolytic and proteolytic activities of <i>Bacillus</i> and LAB from <i>turangbai</i>	330
Enzymatic profiles	332
PGA- production by <i>Bacillus</i> spp. of <i>turangbai</i> and <i>bekang</i>	333
Degradation of PGA by LAB strains	334
Acidification and coagulation activities	335
Antimicrobial activities	336

Screening of biogenic amines-producing LAB	337
Hydrophobicity of the LAB strains	338
Degradation of antinutritive factors	339
Antioxidant capacity and total phenol content	340
<i>Turangbai</i> and <i>bekang</i> preparation by selected starter cultures	344
Conclusion	346
SUMMARY	348
BIBLIOGRAPHY	354
PUBLICATIONS	

i). **Chettri, R.**, and Tamang, J.P. (2008). Microbiological evaluation of *Maseura* and ethni fermented legume based condiment of Sikkim. *Journal of Hill Research* 21(1):1-7.

ii). Tamang, J.P., **Chettri, R.** and Sharma, R.M. (2009). Indigenous knowledge of Norht-East Women on production of ethnic-fermented soyabean foods. *Indian Journal of Traditional Knowledge* 8(1):122-126.

iii). Omizu, Y., Tsukamoto, C., **Chettri, R.** and Tamang, J.P. (2011). Determination of saponin contents in raw soybean and fermented soybean foods of India. *Journal of Scientific and Industrial Research* 70: 533-538.