

**MICROBIOLOGICAL AND PHYSICO-CHEMICAL
ANALYSIS OF ALCOHOLIC BEVERAGES OF
KATHMANDU VALLEY**

A Dissertation

Submitted to the Central department of Microbiology

Tribhuvan University

In Partial Fulfillment of the Requirements for the Award of the Degree of
Master of Science in Microbiology

Submitted by

BHIM SHREES

Central Department of Microbiology

Tribhuvan University

Kritipur, Kathmandu

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LETTER OF RECOMMENDATION

This is to certify that **Mr. Bhim Shrees** has completed his dissertation work entitled "**Microbiological and Physico-Chemical Analysis of Alcoholic Beverages of Kathmandu Valley**" as a partial fulfillment of the M.Sc. Degree in Microbiology under my supervision. To my knowledge his work has not been submitted for any other degree.

Dr. Anjana Singh
Head of Department
Central Department of Microbiology
Tribhuvan University
Kirtipur, Kathmandu.

Date :

CERTIFICATE OF APPROVAL

On the recommendation of Dr. Anjana Singh this dissertation work of Mr. Bhim Shrees is approved for the examination and is submitted to the Tribhuvan University in partial fulfillment of the requirement of M.Sc. Degree in Microbiology.

Dr. Anjana Singh
Head of Department
Central Department of Microbiology
Trivhuvan University
Kirtipur, Kathmandu

Date :

BOARD OF EXAMINERS

Recommended by:

Dr. Anjana Singh
Supervisor

Approved by:

Dr. Anjana Singh
(Head of Department)

Examined by:

(External Examiner)

(Internal Examiner)

Date :

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ABSTRACT

Three of each alcoholic beverage (Beer, *Jand* and *Raksi*) were collected from retail shops covering the Kathmandu valley and analyzed for their total bacterial count, coliform count and yeast and mold count. Pour plate technique and MF-technique were applied for bacteriological count. The total bacterial count of beverages had done by MF - Technique and total bacterial count was ranging from 23 to 128 cfu/100ml. Similarly, in case of yeast and mold count was ranging from 5×10^2 cfu/ml to 19×10^8 cfu/ml. In case of *Raksi* total bacterial count as well as yeast and mold count was nil. Yeast and mold count in beer was ranging from 39 cfu/100ml 134 cfu/100 ml. Total coliforms were not found in any analyzed samples. Amongst bacterial isolates *Bacillus* sps., *Staphylococcus aureus*, *Pseudomonas* sps., *Enterobacter* sps. etc. were predominant.

Analyzed chemical parameters were temperature, pH, acidity and alcohol percentage. The averages pH, acidity, Brix, alcohol percentage of beer was 4.55, 0.151, 5.196, and 5.15 respectively. The average value of pH, acidity, Brix, alcohol content of *Jand* and *raksi* were 4.02, 0.28, 3.31, 4.6 and 3.98, 0.0151, 6.81, 22.8 respectively.

Microbiological parameters showed that there was high in count of micro-organisms as compare to recommended value. While, chemical parameters satisfy the recommend value. Beverages sold in Kathmandu valley is contaminated through external source due to unhygienic handling and storage. Bottles and closures are another possible source for bottled beverages. It also contains several pathogens in it indicating unsanitary practice during manufacture.

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ABBREVIATIONS

BC	: Before Christ
FSC	: Food Standard Committee
FAO	: Food and Agriculture Association
HMG	: His Majesty's Government
IS	: International Standard
MA	: MacConkey Agar
MHA	: Muller Hinton Agar
MR	: Methyl Red
MSA	: Mannitol Salt Agar
NA	: Nutrient Agar
NB	: Nutrient Broth
NS	: National Standard
PCA	: Plate Count Agar
PDA	: Potato Dextrose Agar
TSI	: Triple Sugar Iron
USA	: United State of America
VP	: Vogs Proskeur
VRBA	: Violet Red Bile Agar
Zn	: Zinc