

**STABILIZATION OF ALOE VERA GEL AND DEVELOPMENT
OF ITS STANDARDIZED TOPICAL HERBAL FORMULATIONS**

by

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to the**



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CERTIFICATE

This is to certify that the thesis entitled 'STABILIZATION OF ALOE VERA GEL AND DEVELOPMENT OF ITS STANDARDIZED TOPICAL HERBAL FORMULATIONS' being submitted by Mr. Parag M. Bhurchandi to the Indian Institute of Technology, Delhi for the award of the degree of Doctor of Philosophy is a record of the original bonafide research work carried out by him under my guidance and supervision in confirmation with the rules and regulations of Indian Institute of Technology, Delhi.

The research report and the results presented in this thesis have not been submitted in part or full to any other university or institute for award of any degree/diploma.

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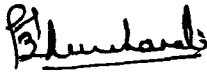
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ABSTRACT

Recent research on the diverse medicinal, cosmetic and nutritional properties of *Aloe vera* leaves has imparted tremendous commercial potential to this plant all over the world. Physico-chemical stability of Aloe vera gel is an important consideration in the post-harvest processing of *Aloe vera* leaves because it ultimately affects its quality, therapeutic efficacy as well as marketability of the gel and its products.

Enzymatic and microbial degradation is the major stability problem associated with Aloe vera gel. It would seem that many of the inconsistent clinical results obtained for therapeutic efficacy of Aloe vera gel result from the different processes to which the plant material is subjected after its removal from the parent plant. In the commercial literature there are claims and counter-claims as to the superiority of one or other process.

Present work deals with development of a process for stabilization of freshly prepared liquid *Aloe vera* gel, designating a biomarker component for meaningful analysis as well as quality control of the gel and development of its standardized topical herbal formulations for topical antibacterial-antifungal and cosmetic/skin beneficial purposes.

Effective stabilization of the liquid Aloe vera gel against microbial as well as enzymatic degradation of the active polysaccharides/glucomannan by a process involving use of antimicrobial and chemical preservatives as well as heat treatment (HTST or high temperature short time treatment) with immediate flash cooling has been achieved.

Glucomannan, as a class of polysaccharides; characteristic to the Aloe vera gel, has been considered as the marker component. Glucomannan content has been estimated and monitored as a chemical parameter for evaluation of stability of Aloe vera gel during the course of present work.

Topical polyherbal formulations of Aloe vera gel were developed by using herbal ingredients of assured quality. The topical formulations with proposed topical antibacterial-antifungal activities were formulated in carbopol gel and polyethyleneglycol (PEG) bases while the topical formulation with proposed cosmetic and skin-beneficial properties was formulated in O/W emulsion base and modified vanishing cream base. Physical, formulation and therapeutic properties of the developed formulations were evaluated.

CONTENTS

	Page No.
Certificate	i
Acknowledgments	ii
Abstract	iv
Contents	vi
List of Figures	vii
List of Tables	x
Chapter: 1 INTRODUCTION	1-8
Chapter: 2 OBJECTIVES AND PLAN OF WORK	9
Chapter: 3 REVIEW OF LITERATURE	10-32
Chapter: 4 MATERIAL AND METHODS	33-51
Chapter-5 RESULTS AND DISCUSSION	52-91
Chapter 6 SUMMARY AND CONCLUSIONS	92-94
References	95-103