ESTIMATION OF BLENDS OF CANDELILLA WAX AND PLANT EXTRACTS FOR FRUIT STORAGE

By:

AQSA FARZAND

ID: s2016140018

SUPERVISOR:

DR. AYESHA MOHYUDDIN

DEPARTMENT OF CHEMISTRY
SCHOOL OF SCIENCE
UNIVERSITY OF MANAGEMENT AND TECHNOLOGY,
LAHORE, PAKISTAN

2018

ESTIMATION OF BLENDS OF CANDELILLA WAX AND PLANT EXTRACTS FOR FRUIT STORAGE

Submitted to University of Management and Technology Lahore

In partial fulfillment of the requirements

For the award of degree of

MS
IN
CHEMISTRY

BY

AQSA FARZAND

ID

s	2	0	1	6	1	4	0	0	1	8

SESSION: 2016-2018

DEPARTMENT OF CHEMISTRY
SCHOOL OF SCIENCE
UNIVERSITY OF MANAGEMENT AND TECHNOLOGY,
LAHORE, PAKISTAN


بسم الله الرحمن الرحيم

RESEARCH COMPLETION CERTIFICATE

Certified that the research work contained in this thesis titled,**"Estimation of blends of Candelilla wax and plant extracts for fruit storage"** has been carried out and completed by Aqsa Farzand, **ID: s2016140018.** The quantum and the quality of the work contained in this is adequate for the award of Degree of MS.

Supervisor
Dr Ayesha Mohy-Ud-Din
Associate Professor
Department of Chemistry,
UMT, Lahore.

External Examiner

Chairperson
Dr Ayesha Mohy-Ud-Din
Associate Professor
Department of Chemistry,
UMT, Lahore.

Dean
Dr Muhammad Azhar Iqbal
Professor
School of Science,
UMT, Lahore.

DECLARATION

I, **Aqsa Farzand** D/O **Farzand Ali** ID: **s2016140018** Session **2016-2018**

hereby declare that the matter printed in the thesis titled **"Estimation of blends of Candelilla wax and plant extracts for fruit storage "** is my own work and has not been printed, published and submitted as research work, thesis or publication in any form in any University, Research institution etc. in Pakistan or Abroad.

Dated: _____ _____

(Aqsa Farzand)

DEDICATION

Dedicated to my loving **Parents** and **Teachers**,

Without their knowledge, wisdom, and

Guidance, I would not have met the goals

I have to strive and be the best to

Reach my dreams!

CONTENTS

LIST OF TABLES

LIST OF FIGURES

ACKNOWLEDGEMENTS

Firstly, I am thankful to **Allah Almighty** for giving me strength and courage at each and every step in accomplishment of this thesis. Countless salutations are upon the **Holy Prophet (**Peace be upon him) who enabled me to recognize my Creator and declared it to be an obligatory duty of every Muslim to acquire knowledge.

I would like to honor the special regards to **Dr. Muhammad Azhar Iqbal** Dean of school of Science UMT, who takes special interest in research activities. I feel great great pleasure in bringing on my deep sense of gratitude for help and cooperation in providing the facilities throughout the research period.

I am most thankful to my supervisor and my inspiration **Dr. Ayesha Mohyuddin** not only for providing me opportunity to do my research work but also for her dynamic elaborate instructions, enlightening suggestions, illustrious advices, and persistent help and clarifying my concepts relating to course work and guiding me at each and every step of this research work. Her help of constructive comments and suggestions throughout the experimental and thesis work have contributed to the success of this research.

It is fact that I would not be successful in my aim without sincerest prayers and guidance of **Muhammad Hashim**. All of his prayed for my brilliant success and provided me every facilities and cooperation during my academic career with tremendous love and honor.

Aqsa Farzand

ABSTRACT

Now a days there is high demand for healthier and fresh food consumption by society. In recent years, naturally occurring substances have been mainly focused to process fruits and vegetable being as alternative antioxidants and antimicrobials. Blending of plant extracts of medicinal plants with Candelilla wax used for edible coating has been experimented by different researchers. In this study two medicinal plants are selected who are known to have antifungal potential. *Cassia Fistula* commonly known as Amaltash phal is one of most versatile medicinal plant of Fabaceae family which have great attraction for scholars. Studies showed the presence of antifungal activity present in leaves extracts. Its active components have reported pharmacological effects like antimicrobial, antioxidant, anti-inflammatory, hepaprotective and hypoglycemic potential. The powdered leaves of *C. fistula* were extracted in Soxhlet extractor with methanol. *Achyranthes aspera* belongs to the Amaranthaceae family. The plant are used to cure antirhematic, diuretic, dental pain or menstrual discomfort. Studies reveals that antifungal properties are depicted in plant leaves extracts. The well knowns ingredients which were isolated from this plant are flavones derivatives (astragalin, isoquercetin), phenolic acids, sterols, quinones, polysaccharides, saponins. The powdered leaves of *A. aspera* and *C. fistula* were extracted with methanol. This study will be useful to explore the application of blended wax to prolong the freshness of fruit on industrial scale. In this study, Films formulated with edible natural wax, and additives *A. aspera* and *C. fistula* were applied to evaluate their effects on the quality of fruits. Weight loss activity was performed against all samples. ECAA and ECCF showed a lowest weight loss as compared to ECC and WOC. In ECAA film there was less weight loss started from 0.3g to 1.5g after 150h in apples. In ECCF, 0.2g to 1.2g weight loss was found after 150 in apples, but on the other hand weight loss activity in ECC 0.3 to 3.0 and WOC 0.4 to 1.8 after 150h, that was higher as compared to ECAA and ECCF. ECAA and ECCF showed good result in apples but in bananas and lemons, due to sensitivity of fruits it's showed higher weight and pH loss.

CHAPTER 1

INTRODUCTION

1.1 IMPORTANCE OF PLANT

From thousands of years, nature has been a source of natural products and many of these are isolated from medicinal plants. In medicinal plants, there are a numbers of phytochemical compounds, which are not only helpful in the functioning of body but also help in fighting against diseases. Traditional medicinal plant produce a wide range of bioactive compounds or molecules that are help in the treatment of different diseases. Today most of the drugs are obtained from natural products or semi synthetic natural products (Sukanya *et al*, 2009). 20% of the plants has been uses in the pharmaceutical industry to attain a wide range of antibiotics that are obtained from natural or synthetic drugs (Mothana *et al*, 2005).