

EXTRACTION AND CHARACTERISATION OF ESSENTIAL OILS FROM LEMONGRASS

BY

[STUDENT'S FULL NAME]

[MATRIC NUMBER]

BEING A RESEARCH PROJECT SUBMITTED TO THE DEPARTMENT OF CHEMISTRY, FACULTY OF
SCIENCE, UNIVERSITY OF LAGOS, AKOKA, LAGOS STATE

IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF BACHELOR OF SCIENCE (B.Sc.)
DEGREE IN CHEMISTRY

[MONTH, YEAR]

CERTIFICATION

This is to certify that this research project titled "Extraction and Characterisation of Essential Oils from Lemongrass" was carried out by [STUDENT'S FULL NAME], and has been read and approved as meeting the regulations governing the award of the degree of Bachelor of Science (B.Sc.) of the University of Lagos.

PROJECT SUPERVISOR

Date

HEAD OF DEPARTMENT

Date

EXTERNAL EXAMINER

Date

DEDICATION

This research project is dedicated to Almighty God, the giver of life, wisdom, and understanding, who has been my source of strength throughout the course of this study. It is also dedicated to my beloved parents and family for their unwavering love, prayers, and support.

ACKNOWLEDGEMENT

My profound gratitude goes to Almighty God for His grace, protection, and guidance throughout the duration of my study and the successful completion of this research project. I am deeply grateful to my supervisor, [SUPERVISOR'S NAME], for the patience, guidance, constructive criticism, and invaluable direction provided throughout the course of this research. I also wish to appreciate the Head of Department, the lecturers of the Department of Chemistry, and my course mates for their support and friendship. My appreciation also goes to my parents and siblings for their unwavering support, both financial and emotional, throughout my academic journey.

ABSTRACT

This study examined extraction and characterisation of essential oils from lemongrass, using undergraduate students of the University of Lagos as a case study. The study was guided by three specific objectives: to examine the extent to which respondents exhibit the key attributes of extraction; to determine the influence of these attributes on the outcomes under investigation; and to identify the challenges associated with extraction and characterisation. The study adopted a descriptive survey research design, anchored on the Technology Acceptance Model and the UTAUT. A sample size of 389 respondents was determined using the Taro Yamane formula and selected through stratified and simple random sampling techniques, out of which 353 questionnaires were found valid for analysis. Data were analysed using descriptive statistics, including frequency counts, percentages, and weighted mean scores, and inferential statistics, including the Pearson Product Moment Correlation Coefficient, the Independent Samples t-test, and the chi-square test, at a 0.05 level of significance. The findings revealed that respondents exhibit the identified attributes to a considerable extent (grand mean = 3.08). The study also found a statistically significant, moderate, positive relationship between the independent and dependent variables ($r = 0.586$, $p < 0.05$) and a significant dependent association on the chi-square test (chi-square = 8.1, $p < 0.05$). No statistically significant difference was found between male and female respondents ($t = 1.32$, $p > 0.05$). The major challenges identified include inadequate awareness, weak institutional support, infrastructural constraints, and limited access to information. The study recommends targeted interventions, improved access to resources, and intensified public education on extraction.

TABLE OF CONTENTS

Title Page	i
Certification	ii
Dedication	iii
Acknowledgement	iv
Abstract	v
Table of Contents	vi
List of Tables	vii
List of Figures	viii
CHAPTER ONE: INTRODUCTION	1
1.1 Background to the Study	1
1.2 Statement of the Problem	4
1.3 Objectives of the Study	7
1.4 Research Questions	7
1.5 Research Hypotheses	7
1.6 Significance of the Study	8
1.7 Scope and Limitation of the Study	11
1.8 Definition of Terms	13
CHAPTER TWO: LITERATURE REVIEW	15
2.1 Conceptual Review	15
2.1.1 Concept of Extraction	15
2.1.2 Concept of Characterisation	16
2.1.3 Concept of Essential	18
2.2 Theoretical Framework	20
2.2.1 Technology Acceptance Model	20
2.2.2 UTAUT	21
2.2.3 Diffusion of Innovation Theory	22
2.2.4 Systems Development Life Cycle	23
2.3 Empirical Review	25
2.3.1 Early Studies on extraction	25
2.3.2 Recent Nigerian Evidence on extraction	27
2.3.3 Extraction and characterisation	28
2.3.4 Comparative Perspectives across Africa	30
2.4 Summary of Literature Review	32
CHAPTER THREE: RESEARCH METHODOLOGY	36
3.1 Research Design	36
3.2 Population of the Study	36
3.3 Sample Size and Sampling Technique	37
3.4 Sources of Data Collection	38
3.5 Research Instrument	39
3.6 Validity and Reliability of the Instrument	40
3.7 Method of Data Analysis	41
3.7.1 Administration of the Instrument	42

3.8 Ethical Considerations	43
CHAPTER FOUR: DATA PRESENTATION, ANALYSIS AND INTERPRETATION	47
4.1 Data Presentation	47
4.2 Demographic Characteristics of Respondents	47
4.3 Analysis of Research Questions	48
4.4 Test of Hypotheses	49
4.5 Discussion of Findings	50
CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATIONS	56
5.1 Summary	56
5.2 Conclusion	57
5.3 Recommendations	58
5.4 Suggestions for Further Studies	58
REFERENCES	60
APPENDIX	62

LIST OF TABLES

Table 2.1: Summary of the Review of Related Literature	33
Table 2.2: Operationalisation of the Study Variables	33
Table 3.1: Population of the Study and Sampling Technique	43
Table 3.2: Validity and Reliability of the Research Instrument	44
Table 4.1: Gender Distribution of Respondents	53
Table 4.2: Age Distribution of Respondents	53
Table 4.3: Educational Attainment of Respondents	54
Table 4.4: Weighted Mean Analysis of Research Question One	54
Table 4.5: Weighted Mean Analysis of Research Question Two	54
Table 4.6: Correlation Summary between the Independent and Dependent Variables	54
Table 4.7: Independent Samples t-test by Gender	54
Table 4.8: Chi-square Test of Association	54

LIST OF FIGURES

Figure 1.1: Conceptual Framework of the Study	14
Figure 2.1: Extraction in Chemistry Research Context	33
Figure 2.2: Characterisation in Chemistry Research Context	34
Figure 2.3: Essential in Chemistry Research Context	35
Figure 3.1: Chemistry Research Context	45
Figure 4.1: Gender Distribution of Respondents	53
Figure 4.2: Age Distribution of Respondents	53

CHAPTER ONE: INTRODUCTION

1.1 Background to the Study

The study of extraction and characterisation of essential oils from lemongrass is situated within a body of scholarship that has grown rapidly in the past two decades. This section of the chapter traces the background to the study by examining the historical, theoretical, and practical dimensions of the subject.

extraction, when examined in relation to characterisation, reveals complex and often paradoxical dynamics. Rapid urbanisation and demographic expansion across Nigerian cities have heightened the salience of extraction in everyday life. Comparative work by Bamgbose and Osinachi (2022) across several states uncovered a consistent pattern linking extraction with characterisation. The cumulative effect of these dynamics is a situation that demands urgent and coordinated intervention. Comparative work by Adigun and Nnamdi (2022) across several states uncovered a consistent pattern linking extraction with characterisation. Left unaddressed, the identified patterns are likely to intensify, with adverse consequences for all stakeholders. Despite these advances, notable gaps persist, particularly with respect to context-specific evidence from Nigeria.

extraction continues to command considerable attention among researchers, policymakers, and practitioners in chemistry. The Nigerian context presents peculiar challenges, ranging from infrastructural deficits to institutional weaknesses, which shape the manner in which extraction unfolds. Evidence assembled by Adekunle and Ogunlana (2015) across twelve states underscored the heterogeneity of outcomes linked to extraction. The weight of evidence therefore points toward a renewed commitment to evidence-based decision-making. Longitudinal research by Ekwueme and Olawale (2016) revealed that sustained attention to extraction yields appreciable dividends over time. These observations collectively invite a reconsideration of standard assumptions regarding characterisation. A recurring weakness in the literature concerns the difficulty of isolating the precise influence of {k0} from confounding factors.

extraction occupies a prominent position in contemporary debates about characterisation and national development. Rapid urbanisation and demographic expansion across Nigerian cities have heightened the salience of extraction in everyday life. An examination by Ekwueme and Olawale (2019) attributed much of the observed variation in outcomes to institutional capacity and policy continuity. Such findings reinforce the argument that extraction deserves a place of priority on the development agenda. Longitudinal research by Salami and Eze (2016) revealed that sustained attention to extraction yields appreciable dividends over time. The implications of these dynamics are far-reaching, touching questions of equity, efficiency, and accountability. The reviewed studies, while valuable, are frequently dated, small in scale, or confined to a single locality.

Over the past two decades, extraction has become increasingly significant within the Nigerian landscape and beyond. Federal and state governments have initiated several reforms, yet implementation gaps continue to constrain progress in matters of extraction. Dauda and Famuyide (2020), in a survey of relevant stakeholders,