Quality Assessment and Standardization of "Seetharama Watee" and "Matha Waththikaava Watee"

in

Tissa Hewavithana

Thesis Submitted to University of Sri Jayewardenepura for the award of the Degree of Doctor of Philosophy in Food Science and Technology on 2012
The work described in this thesis was carried out by me under the Supervision of Prof. K.K.D.S. Ranaweera Prof. M.H.A. Tissera and Prof. P.A.J. Yapa and a report on this has not been submitted in whole in part to any university or other institution for another Degree/Diploma.

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AFFECTIONATELY DEDICATED

TO

My Late Mother and Father
# Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table of Contents</td>
<td>i</td>
</tr>
<tr>
<td>List of Tables</td>
<td>xii</td>
</tr>
<tr>
<td>List of Figures and Plates</td>
<td>xxi</td>
</tr>
<tr>
<td>Abbreviations</td>
<td>xxxvii</td>
</tr>
<tr>
<td>Acknowledgments</td>
<td>xxxix</td>
</tr>
<tr>
<td>Abstract</td>
<td>xl</td>
</tr>
</tbody>
</table>

## Chapter 1

### Introduction

1.1 Background                                  | 1
1.2 Objectives                                 | 8

## Chapter 2

### Literature Review

2.1. Herbal Medicine                           | 9
2.1.1. Herbs                                   | 9
2.1.2. Herbal Material                         | 9
2.1.3. Herbal Preparations                     | 9
2.1.4. Finished Herbal Products                | 10
2.1.5. Traditional Use of Herbal Medicines     | 10
2.1.6. Limitation of Herbal Medicines          | 11
2.2. Watika Prakaranaya or Treatment of pills

2.2.1. Watce and Gutika

2.3. Seetharama Watce

2.3.1. Cuminum cyminum (fruit)

2.3.2. Nigella sativa (seed)

2.3.3. Foeniculum vulgare (fruit)

2.3.4. Trachyspermum ammi (fruit)

2.3.5. Anethum graveolens (fruit)

2.3.6. Zingiber officinale (rhizome)

2.3.7. Piper nigrum (fruit) Piperaceae

2.3.8. Piper longum (fruit) Piperaceae

2.3.9. Myristica fragrans (fruit and aril)

2.3.10. Syzygium aromaticum (flower bud)

2.3.11. Aconitum palmatum (rhizome)

2.3.12. Saussurea costus (root)

2.3.13. Glycyrrhiza glabra (stem & root)

2.3.14. Allium sativum (bulb)

2.3.15. Coriandrum sativum (fruit)

2.3.16. Holarrhena antidysenterica (stem bark)

2.3.17. Pteracapus santalinus (heart wood) Fabaceae

2.3.18. Aconitum heterophyllum (root) Ranunculaceae

2.3.19. Picrorhiza kurrooa (rhizome) Scrophulariaceae

2.3.20. Ferula assa-foetida (Oleo-gum resin) Apiaceae

2.3.21. Ocimum tenuiflorum (leaf) Lamiaceae
2.3.22. *Vitex nigundo*, (leaf) Verbenaceae 34
2.3.23. *Toddalia asiatica* (leaf) Rutaceae 35
2.3.24. *Leucas zeylanica*, (leaf) Lamiaceae 35
2.3.25. *Cleome gynandra* (leaf) Capparidaceae 35
2.3.26. *Azadirachta indica* (leaf) Meliaceae 36
2.3.27. *Acorus calamus*, (rhizome) Araceae 37
2.3.28. Orpiment-*Harithala*, (Yellow arsenic) As₂S₃ 38
2.3.29. Zinc ore—Rasaka (Calamine) ZnCO₃ 39
2.3.30. Blue vitriol-*Thutta* (CuSO₄·5H₂O) 39
2.3.31. Rock salt-*Saindhava Lavana* (NaCl) 40
2.3.32. Cinnabar- *Hingula*, (Hgs) 40
2.3.33. Alum sulphate - Sphatika K₂SO₄·Al₂(SO₄)₃·24H₂O 41
2.3.34. Realgar - *Manashila* (Arsenic disulphide) As₄S₄ / As₂S₂ 41
2.3.35. Borax- Pushkara/Tankana Na₂B₄O₇·10H₂O 42
2.3.36. Gypsum- *Godanthi* CaSO₄·2H₂O 42
2.3.37. *Citrus aurantium* (fruit) Rutaceae 43
2.3.38. Fresh Ginger 43
2.3.39. Neem Oil 43
2.3.40. Cow’s Ghee 43
2.4. Maha Varthikava Waste 44
2.4.1. *Cuminum cyminum*, (fruit) 44
2.4.2. *Nigella sativa*, (Seed) 44
2.4.3. *Allium sativum*, (bulb) 44
2.4.4. *Trachysperm ammi*, (fruit) 44
2.4.5. *Trigonella foenum-graecum*, (fruit) 44
2.4.6. *Zingiber officinale*, (rhizome) 45
2.4.7. *Ferula assa-foetida*, (exudate) 45
2.4.8. *Piper longum*, (fruit) 45
2.4.9. *Piper nigrum*, (fruit) 45
2.4.10. *Solanum virginianum*, (root) 45
2.4.11. *Terminalia chebula*, (fruit pericarp) 47
2.4.12. *Terminalia bellarica*, (fruit pericarp) 47
2.4.13. *Phyllanthus emblica*, (fruit) 48
2.4.14. *Syzygium aromaticum*, (flower bud) 49
2.4.15. *Myristica fragrans*, (fruit & aril) 49
2.4.16. *Fumaria parviflora*, (whole plant) 49
2.4.17. *Caesalpinia bonduc*, (seed) 50
2.4.18. *Carum cavi*, (fruit) 51
2.4.19. *Cinnamomum verum* (bark) 52
2.4.20. *Acorus callamus*, (rhizome) 53
2.4.21. *Sesamum indicum*, (seed) 53
2.4.22. *Brassica juncea* (seed) 54
2.4.23. *Embelica ribes* (seed), 54
2.4.24. *Santalum album*, (heart wood) 55
2.4.25. *Acasia chundra*, (dried water extract) 56
2.4.26. *Mesua ferrea*, (stamens) 57
2.4.27. *Piper betel*, (leaf) 57
2.4.28. *Vitex nigundo* (leaf) 58
2.4.29. Bee's honey 59
2.5. Standards 59
2.5.1. Standardization Aspects 60
2.6. Quality Assessment 60
2.6.1. Standardization of Crude Drugs 61
2.6.2. Standardization of Pharmaceutical Process 65
2.6.3. Standardization of Finished Products 67
2.7. Standardization Using the Quality Assessment Methods 68
2.7.1. Evaluation of the Quality Assessment 68
2.8. Physico-Chemical Parameters of the Finished Products 73
2.8.1. Variation in Weight 74
2.8.2. pH (10% w/v aqueous solution) 74
2.8.3 Specific Gravity 74
2.8.4. Weight loss on Drying 75
2.8.5. Total Ash Content 75
2.8.6. Acid Insoluble Ash 76
2.8.7. Crude Fiber Content 76
2.8.8. Disintegration Test 77
2.8.9. Hardness Test 77
2.8.10. Friability Test 78
2.9. Phytochemical Screening 78
2.9.1. Extractable Values 79
2.9.2. TLC Fingerprint 79
2.9.3. UV-Vis Spectrophotometrical Measurements 81
2.9.4. High Performance Liquid Chromatography (HPLC) Profiles 81
2.10. Microbiological Screening 82
2.10.1. Indole Methyl Red Vogues Proskauer and Citrate Utilization test (IMViC) 82
2.10.2. Mycological contaminants 84
2.10.3. Pour plate method 84
2.11. Residual Analysis 85
2.11.1. Heavy metal determination 85
2.11.2. Aflatoxin determination 88

Chapter 3

Materials and Methods:

3.1. Selection of Samples 92
3.2. Method of Sample Preparation 93
3.2.1. Sectharama Watee 93
3.2.2. Maha Varthikava Watee 97
3.3. Quality Assessment Methods for Standardization 99
3.3.1. Determination of Variation of Weight 99
3.3.2. Determination of pH value 100
3.3.3. Determination of Specific Gravity 100
3.3.4. Determination of Weight loss on Drying 101
3.3.5. Determination of Total Ash Content 101
3.3.6. Determination of Acid Insoluble Ash Content 102
3.3.7. Determination of Crude Fiber Content 102
3.3.8. Determination of Disintegration Time
3.3.9. Determination of Hardness
3.3.10. Determination of Friability
3.3.11. Sequential Extractions
3.3.11.1. Preparation of hexane extracts
3.3.11.2. Preparation of dichloro methane extracts
3.3.11.3. Preparation of ethyl acetate extracts
3.3.11.4. Preparation of methanol extracts
3.3.12. Thin Layer Chromatography (TLC)
3.3.13. UV Spectrophotometry
3.3.14. High Performance Liquid Chromatography (HPLC)
3.3.15. Heavy Metal Detection
3.3.15.1. Preparation of samples
3.3.15.1.1. Dry-ashing technique
3.3.15.1.2. Wet-ashing technique
3.3.15.2. Preparation of the set of standard solutions
3.3.16. Microbiological Analysis
3.3.16.1. IMViC test
3.3.16.1.1. Indole test
3.3.16.1.2. Methyl Red test
3.3.16.1.3. Vogues Proskauer test
3.3.16.1.4. Citrate test
3.3.16.2. Preparation method of dilution series of samples
3.3.16.3. Preparation method of agar plates
3.3.16.4. Calculation of colony forming units  
3.3.16.5. Calculation of growth on solid media  
3.3.16.6. Identification of fungi in Seetharama Watee and Maha Varthikava Watee  
3.3.17. Detection of Aflatoxin  
3.3.17.1. TLC Method  
3.3.17.1.1. Sample preparation  
3.3.17.1.2. Clean up procedure  
3.3.17.1.3. TLC fingerprints  
3.3.17.1.4. Solvent system for two-dimensional TLC  
3.3.17.1.5. Aflatoxin confirmatory method  
3.3.17.2. HPLC Method  
3.3.17.2.1. Sample derivatisation  
3.3.17.2.2. Sample application  
3.3.18. Data Analysis  

Chapter 4  

Results and Discussion:

4.1. Variation in Weight  
4.2. pH value  
4.3. Specific Gravity  
4.4. Loss on Drying  
4.5. Total Ash  
4.6. Acid Insoluble Ash
4.7. Crude Fiber Content 135
4.8. Disintegration Time 137
4.9. Friability 139
4.10. Hardness 140
4.11. Sequential Extractions 143
4.11.1. Hexane extractions 143
4.11.2. Dichloro methane extractions 145
4.11.3. Ethyl acetate extractions 147
4.11.4. Methanol extractions 149
4.12. Thin Layer Chromatography (TLC) 151
4.13. UV Spectrophotometric studies 211
4.14. High Performance Liquid Chromatography (HPLC) 214
4.14.1.1. HPLC analysis of the sample 1S 0 214
4.14.1.2. HPLC analysis of the sample 2S 0 215
4.14.1.3. HPLC analysis of the sample 3S 0 217
4.14.1.4. HPLC analysis of the sample S 1 218
4.14.1.5. HPLC analysis of the sample S 2 219
4.14.1.6. HPLC analysis of the sample S 3 220
4.14.1.7. HPLC analysis of the sample S 4 222
4.14.1.8. HPLC analysis of the sample S 5 223
4.14.2.1. HPLC analysis of the sample 1V 0 227
4.14.2.2. HPLC analysis of the sample 2V 0 229
4.14.2.3. HPLC analysis of the sample 3V 0 231
4.14.2.4. HPLC analysis of the sample V 1 233
4.14.2.5. HPLC analysis of the sample V₂
4.14.2.6. HPLC analysis of the sample V₃
4.14.2.7. HPLC analysis of the sample V₄
4.14.2.8. HPLC analysis of the sample V₅
4.15. Heavy metals using Atomic Absorption Spectroscoppe (AAS Method)
  4.15.1. Mercury (Hg)
  4.15.2. Arsenic (As)
  4.15.3. Cadmium (Cd)
  4.15.4. Lead (Pb)
4.16. Microbiological Assessments
  4.16.1. IMViC test
  4.16.2. Colony Forming Units (CFU)
  4.16.3. Calculations of the growth and colour changes in the selected media
4.17. Aflatoxins
  4.17.1. TLC method based on fluorescence
  4.17.2. TLC analysis with 25% H₂SO₄
  4.17.3. Two-dimensional TLC method
  4.17.4. Two-dimensional TLC after spraying with 25% H₂SO₄
  4.17.5. HPLC method
Chapter 5

Conclusion:

5.1. Proposed specifications for Seetharama Watee

5.2. Proposed specifications for Maha Varthikava Watee

Chapter 6

References:

Chapter 7

Appendices:

Appendix I
List of Publications and Communications from the thesis

Appendix II
Purification methods of mineral raw materials

Appendix III
III A. Chemical compositions of reagents and stains used
III B. Media used
III C. Spray reagents
III D. Solutions

Appendix IV
Colony diameter in various media

Appendix V
TLC profiles /patterns and UV absorption spectra
List of Tables

Table 3.1. Herbal ingredient of Seetharama Watee 93
Table 3.2. Mineral ingredients of Seetharama Watee 96
Table 3.3. Herbal ingredients of Maha Varthikava Watee 97
Table 3.4. Measurements made for hollow cathode lamp 112
Table 4.1.1. Weight variation of authentically prepared (10 pills) and commercial samples of Seetharama Watee 122
Table 4.1.2. Weight variation of authentically prepared (10 pills) and commercial samples of Maha Varthikava Watee 123
Table 4.2.1. pH values of authentically prepared and commercial samples of Seetharama Watee 125
Table 4.2.2. pH values of authentically prepared and commercial samples of Maha Varthikava Watee 126
Table 4.3.1. Specific gravity of authentically prepared and commercial samples of Seetharama Watee 127
Table 4.3.2. Specific gravity of authentically prepared and commercial samples of Maha Varthikava Watee 128
Table 4.4.1. Loss on drying of authentically prepared and commercial samples of Seetharama Watee 129
Table 4.4.2. Loss on drying of authentically prepared and commercial samples of Maha Varthikava Watee 130
Table 4.5.1. Total ash content of authentically prepared and commercial samples of Seetharama Watee

Table 4.5.2. Total ash content of authentically prepared and commercial samples of Maha Varthikava Watee

Table 4.6.1. Acid insoluble ash content of authentically prepared and commercial samples of Seetharama Watee

Table 4.6.2. Acid insoluble ash content of authentically prepared and commercial samples of Maha Varthikava Watee

Table 4.7.1. Crude fiber content of the authentically prepared and commercial samples of Seetharama Watee

Table 4.7.2. Crude fiber content of authentically prepared and commercial samples of Maha Varthikava Watee

Table 4.8.1. Disintegration time of authentically prepared and commercial samples of Seetharama Watee

Table 4.8.2. Disintegration time of authentically prepared and commercial samples of Maha Varthikava Watee

Table 4.9.1. Friability of authentically prepared and commercial samples of Seetharama Watee

Table 4.9.2. Friability of authentically prepared and commercial samples of Maha Varthikava Watee

Table 4.10.1. Hardness of authentically prepared and commercial samples of Seetharama Watee

Table 4.10.2. Hardness of authentically prepared and commercial samples of Maha Varthikava Watee
Table 4.11.1.1. Hexane extracts values of authentically prepared and commercial samples of Seetharama Watee

Table 4.11.1.2. Hexane extracts values of authentically prepared and commercial samples of Maha Varthikava Watee

Table 4.11.2.1. Dichloro methane extracts values of authentically prepared and commercial samples of Seetharama Watee

Table 4.11.2.2. Dichloro methane extracts values of authentically prepared and commercial samples of Maha Varthikava Watee

Table 4.11.3.1. Ethyl acetate extracts values of authentically prepared and commercial samples of Seetharama Watee

Table 4.11.3.2. Ethyl acetate extracts values of authentically prepared and commercial samples of Maha Varthikava Watee

Table 4.11.4.1. Methanol extracts values of authentically prepared and commercial samples of Seetharama Watee

Table 4.11.4.2. Methanol extracts values of authentically prepared and commercial samples of Maha Varthikava Watee

Table 4.13.1. \( \lambda_{\text{max}} \) values of the authentically prepared and commercial samples of Seetharama Watee

Table 4.13.2. \( \lambda_{\text{max}} \) values of the authentically prepared sample and commercial samples of Maha Varthikava Watee

Table 4.13.3. \( \lambda_{\text{max}} \) values of Garlic, Asafoetida, Red sandal wood, Ginger, Cinnamon sedge, Holy basil, Indian privet, Neem, Sour orange, Betel, Bee honey, Ghee and Margosa oil
Table 4.14.1. HPLC analysis of sample $S_0$

(254 nm acetonitrile: water 20:30 v/v)  215

Table 4.14.2. HPLC analysis of sample $S_0$

(254 nm acetonitrile: water 20:30 v/v)  216

Table 4.14.3. HPLC analysis of sample $S_0$

(254 nm acetonitrile: water 20:30 v/v)  218

Table 4.14.4. HPLC analysis of sample $S_1$

(254 nm acetonitrile: water 20:30 v/v)  219

Table 4.14.5. HPLC analysis of sample $S_2$

(254 nm acetonitrile: water 20:30)  220

Table 4.14.6. HPLC analysis of sample $S_3$

(254 nm acetonitrile: water 20:30)  221

Table 4.14.7. HPLC analysis of sample $S_4$

(254 nm acetonitrile: water 20:30)  223

Table 4.14.8. HPLC analysis of sample $S_5$

(254 nm acetonitrile: water 20:30)  224

Table 4.14.9. Concentration of chemical compounds in Seetharama Water in HPLC analysis  225

Table 4.14.10. HPLC analysis of sample $1V_0$

(254 nm acetonitrile: water 20:30)  228

Table 4.14.11. HPLC analysis of sample $2V_0$

(254 nm acetonitrile: water 20:30)  230

Table 4.14.12. HPLC analysis of sample $3V_0$

(254 nm acetonitrile: water 20:30)  232
Table 4.14.13. HPLC analysis of sample V₁
(254 nm acetonitrile: water 20:30)  234

Table 4.14.14. HPLC analysis of sample V₂
(254 nm acetonitrile: water 20:30)  236

Table 4.14.15. HPLC analysis of sample V₃
(254 nm acetonitrile: water 20:30)  238

Table 4.14.16. HPLC analysis of sample V₄
(254 nm acetonitrile: water 20:30)  240

Table 4.14.17. HPLC analysis of sample V₅
(254 nm acetonitrile: water 20:30)  242

Table 4.14.18. Concentration of chemical compounds in Maha Varthikava Watee in HPLC analysis  243

Table 4.15.1.1. Mercury content of the authentically prepared and the commercial samples of Seetharama Watee  247

Table 4.15.1.2. Mercury content of the authentically prepared and the commercial samples of Maha Varthikava Watee  248

Table 4.15.2.1. Arsenic content of the authentically prepared and the commercial samples of Seetharama Watee  250

Table 4.15.2.2. Arsenic content of the authentically prepared and the commercial samples of Maha Varthikava Watee  251

Table 4.15.3.1. Cadmium content of the authentically prepared and the commercial samples of Seetharama Watee  252

Table 4.15.3.2. Cadmium content of the authentically prepared and the commercial samples of Maha Varthikava Watee  253
Table 4.1. Lead content of the authentically prepared and the commercial samples of Seetharama Watee 254

Table 4.2. Lead content of the authentically prepared and the commercial samples of Maha Varthikava Watee 255

Table 4.1. Indole test results of the authentically prepared samples, commercial samples of Seetharama Watee and the control media 256

Table 4.2. Indole test results of the authentically prepared samples, commercial samples of Maha Varthikava Watee and the control media 257

Table 4.3. Methyl Red test results of the authentically prepared samples, commercial samples of Seetharama Watee and the control media 258

Table 4.4. Methyl Red test results of the authentically prepared samples, commercial samples of Maha Varthikava Watee and the control media 259

Table 4.5. Voges-Proskauer test results of the authentically prepared samples, commercial samples of Seetharama Watee and the control media 260

Table 4.6. Voges-Proskauer test results of the authentically prepared samples, commercial samples of Maha Varthikava Watee and the control media 261

Table 4.7. Citrate utilization test results of authentically prepared samples commercial samples of Seetharama Watee and the control media 262
Table 4.16.8. Citrate utilization test results of the authentically prepared samples, commercial samples of Maha Varthikava Watee and the control media 263

Table 4.16.9. Colony forming units of the authentically prepared and the commercial samples of Seetharama Watee in Sabouraud glucose agar medium 264

Table 4.16.10. Colony forming units of the authentically prepared and the commercial samples of Maha Varthikava Watee in Sabouraud glucose agar medium 265

Table 4.16.11. Fungi isolated from Seetharama Watee and Maha Varthikava Watee 266

Table 4.16.12. Colony diameter of the selected fungi found in Seetharama Watee in Czapeck dox agar medium 268

Table 4.16.13. Colony colours of Seetharama Watee samples in Czapeck dox agar medium 269

Table 4.16.14. Colony diameter of fungi in Maha Varthikava Watee in Czapeck dox agar medium 270

Table 4.16.15. Colony colours of Maha Varthikava Watee samples in Czapeck dox agar medium 271

Table 4.16.16. Colony diameters of selected fungi found in Seetharama Watee in malt extract agar medium 272

Table 4.16.17. Colony colours of Seetharama Watee samples in malt extract agar medium 273
Table 4.16.18. Colony diameters of the selected fungi found in Maha Varthikava Watee in malt extract agar medium

Table 4.16.19. Colony colours of Maha Varthikava Watee samples in malt extract agar medium

Table 4.17.1. TLC results of the authentically prepared and the commercial samples of Seetharama Watee for aflatoxins, sprayed with 25% H₂SO₄

Table 4.17.2. TLC analysis of the authentically prepared and the commercial samples of Maha Varthikava Watee for aflatoxins, sprayed with 25% H₂SO₄

Table 4.17.3. Two-dimensional TLC results of the authentically prepared and the commercial samples of Seetharama Watee for the detection of aflatoxin

Table 4.17.4. Two-dimensional TLC results of the authentically prepared and the commercial samples of Seetharama Watee sprayed with 25% H₂SO₄ for the detection of aflatoxin

Table 4.17.5. Two-dimensional TLC analysis of the authentically prepared and the commercial samples of Maha Varthikava Watee for the detection of aflatoxin

Table 4.17.6. Two-dimensional TLC analysis of the authentically prepared and the commercial samples of Maha Varthikava Watee sprayed with 25% H₂SO₄ for the detection of aflatoxin
Table 4.17.7. HPLC analysis results of the authentically prepared and the commercial samples of Seetharama Watee for the detection of Aflatoxin

Table 4.17.8. HPLC analysis of the authentically prepared and the commercial samples of Maha Varthikava Watee for the detection of Aflatoxin

Table 5.1.1. Test parameters for quality (Seetharama Watee)

Table 5.1.2. Test parameters for purity (Seetharama Watee)

Table 5.1.3. Test parameters for identity (Seetharama Watee)

Table 5.2.1. Test parameters for quality (Maha Varthikava Watee)

Table 5.2.2. Test parameters for purity (Maha Varthikava Watee)

Table 5.2.3. Test parameters for identity (Maha Varthikava Watee)

Table 7.iii.i. Colony diameters of selected fungi found in Seetharama Watee and Maha Varthikava Watee in Czapeck Dox agar medium

Table 7.iii.ii. Colony diameters of selected fungi found in Seetharama Watee and Maha Varthikava Watee in Malt extract agar medium
List of Figures and plates

Figure 3.1. TLC spotting diagram of Seetharama 107

Figure 3.2. TLC spotting diagram of Varthikava 107

Figure 3.3. Method of sample spotting in 2 dimensional TLC 118

Figure 4.12.1.1. Comparison of R<sub>f</sub> values of the authentically prepared samples, with the commercial samples of Seetharama Watee and red sandalwood samples under UV 254 nm (toluene: ethyl acetate 9:1 v/v) 152

Figure 4.12.1.2. Comparison of R<sub>f</sub> values of the authentically prepared samples, with the commercial samples of Seetharama Watee and red sandalwood samples in iodine vapour (toluene: ethyl acetate 9:1 v/v) 153

Figure 4.12.1.3. Comparison of R<sub>f</sub> values of the authentically prepared samples, with the commercial samples of Seetharama Watee and red sandalwood samples with vanillin sulfuric acid reagent (toluene: ethyl acetate 9:1 v/v) 154

Figure 4.12.1.4. Comparison of R<sub>f</sub> values of the authentically prepared samples, with the commercial samples of Seetharama Watee and red sandalwood sample with anisaldehyde sulfuric acid reagent (n hexane: acetone 3:1 v/v) 155

Figure 4.12.1.5. Comparison of R<sub>f</sub> values of the authentically prepared samples, with the commercial samples of Seetharama Watee and holy basil under UV 254 nm (toluene: ethyl acetate 9:1 v/v) 156
Figure 4.12.1.6. TLC fingerprints of Seetharama Watee and holy basil (Tulasi) samples detected under UV 254 nm

Figure 4.12.1.7. Comparison of $R_f$ values of the authentically prepared samples, with the commercial samples of Seetharama Watee and holy basil samples in iodine vapour (toluene: ethyl acetate 9:1 v/v)

Figure 4.12.1.8. TLC fingerprints of Seetharama Watee and holy basil (Tulasi) samples detected in iodine vapour

Figure 4.12.1.9. Comparison of $R_f$ values of the authentically prepared samples, with the commercial samples of Seetharama Watee and holy basil sample with vanillin sulfuric reagent (toluene: ethyl acetate 9:1 v/v)

Figure 4.12.1.10. TLC fingerprints of Seetharama Watee and holy basil (tulasi) samples after spraying vanillin sulphate

Figure 4.12.1.11. Comparison of $R_f$ values of the authentically prepared samples, with the commercial samples of Seetharama Watee and holy basil sample with anisaldehyde sulfuric reagent (n hexane: acetone 3:1 v/v)

Figure 4.12.1.12. Comparison of $R_f$ values of the authentically prepared samples, with the commercial samples of Seetharama Watee and Indian privet sample under UV 254 nm (toluene: ethyl acetate 9:1 v/v)
Figure 4.12.1.13. Comparison of R_f values of the authentically prepared samples, with the commercial samples of Seetharama Watee and Indian privet samples in iodine vapour (toluene: ethyl acetate 9:1 v/v) 164

Figure 4.12.1.14. Comparison of R_f values of the authentically prepared samples, with the commercial samples of Seetharama Watee and Indian privet sample with vanillin sulfuric acid reagent (toluene: ethyl acetate 9:1 v/v) 165

Figure 4.12.1.15. Comparison of R_f values of the authentically prepared samples with the commercial samples of Seetharama Watee and Indian privet sample with anisaldehyde sulfuric acid reagent (n-hexane: acetone 3:1 v/v) 166

Figure 4.12.1.16. Comparison of R_f values of the authentically prepared sample, with the commercial samples of Seetharama Watee and ginger sample under UV 254 nm (toluene: ethyl acetate 9:1 v/v) 167

Figure 4.12.1.17. Comparison of R_f values of the authentically prepared samples, with the commercial samples of Seetharama Watee and ginger sample in iodine vapour (toluene: ethyl acetate 9:1 v/v) 168

Figure 4.12.1.18. Comparison of R_f values of the authentically prepared samples, with the commercial samples of Seetharama Watee and ginger sample under vanillin sulfuric acid reagent (toluene: ethyl acetate 9:1 v/v) 169
Figure 4.12.1.19. Comparison of $R_f$ values of the authentically prepared samples, with the commercial samples of Seetharama Watee and ginger sample with anisaldehyde sulfuric acid reagent (n-hexane:acetone 3:1)  

Figure 4.12.1.20. Comparison of $R_f$ values of the authentically prepared samples, with the commercial samples of Seetharama Watee and cinnamon sedge sample under UV 254 nm (toluene: ethyl acetate 9:1 v/v)  

Figure 4.12.1.21. Comparison of $R_f$ values of the authentically prepared samples, with the commercial samples of Seetharama Watee and cinnamon sedge sample in iodine vapour (toluene: ethyl acetate 9:1 v/v)  

Figure 4.12.1.22. Comparison of $R_f$ values of the authentically prepared samples, with the commercial samples of Seetharama Watee and cinnamon sedge sample with vanillin sulfuric acid reagent (toluene: ethyl acetate 9:1 v/v)  

Figure 4.12.1.23. Comparison of $R_f$ values of the authentically prepared samples, with the commercial samples of Seetharama Watee and cinnamon sedge sample under UV 254 nm (benzene: acetone, 5:7v/v)  

Figure 4.13.1.24. Comparison of $R_f$ values of the authentically prepared samples, with the commercial samples of Seetharama Watee and cinnamon sedge sample in iodine vapour (benzene: acetone, 5:7v/v)  

Figure 4.13.1.25. Comparison of $R_f$ values of the authentically prepared samples, with the commercial samples of Seetharama Watee and cinnamon sedge sample with anisaldehyde sulfuric acid reagent (n-hexane: acetone, 3:1 v/v)
Figure 4.12.1.26. Comparison of $R_f$ values of the authentically prepared samples, with the commercial samples of Seetharama Watee and garlic sample under 254 UV nm

(n-butanol: propanol: acetic acid: water, 6:2:2:2 v/v)

Figure 4.12.1.27. Comparison of $R_f$ values of the authentically prepared samples, with the commercial samples of Seetharama Watee and garlic sample in iodine vapour

(n-butanol : propanol : acetic acid : water, 6:2:2:2 v/v)

Figure 4.12.1.28. Comparison of $R_f$ values of the authentically prepared samples, with the commercial samples of Seetharama Watee and garlic sample in ninhydrin reagent

(n-butanol : propanol : acetic acid : water, 6:2:2:2 v/v)

Figure 4.12.1.29. Comparison of $R_f$ values of the authentically prepared samples, with the commercial samples of Seetharama Watee and garlic sample in anisaldehyde sulfuric acid reagent

(n-hexane : acetone, 3:1 v/v)

Figure 4.12.1.30. Comparison of $R_f$ values of the authentically prepared samples with the commercial samples of Seetharama Watee and neem sample under UV 254 nm.

(n-hexane : ethyl acetate, 5:5 v/v)

Figure 4.12.1.31. Comparison of $R_f$ values of the authentically prepared samples, with the commercial samples of Seetharama Watee and neem, sample in vanillin sulfuric acid reagent

(n-hexane : ethyl acetate, 5:5 v/v)
Figure 4.12.1.32. Comparison of $R_f$ values of the authentically prepared samples, with the commercial samples of Seetharama Watee and neem sample in anisaldehyde sulfuric acid reagent (n hexane : acetone, 3:1,v/v)

Figure 4.12.1.33. Comparison of $R_f$ values of the authentically prepared samples, with the commercial samples of Seetharama Watee and asafetida sample with anisaldehyde sulfuric acid reagent (n hexane : acetone, 3:1,v/v)

Figure 4.12.1.34. Comparison of $R_f$ values of the authentically prepared samples with the commercial samples of Seetharama Watee and asafoetida sample with anisaldehyde sulfuric acid reagent (Toluene : ethyl acetate : formic acid, 70:30: 3 v/v)

Figure 4.12.1.35. TLC profile/pattern of Seetharama Watee extracted by n-hexane, toluene: ethyl acetate (9:1v/v) solvent system, detected under UV(254nm), (366nm) and with anisaldehyde sulfuric acid reagent

Figure 4.12.1.36. TLC profile/pattern of Seetharama Watee extracted by dichloromethane, toluene: ethyl acetate 9:1(v/v) solvent system, detected under UV(254 nm),(366 nm) and with anisaldehyde sulfuric acid reagent

Figure 4.12.1.37. TLC profile/pattern of Seetharama Watee extracted by ethyl acetate, toluene: ethyl acetate 9:1 (v/v) solvent system, detected under UV (254 nm), (366 nm) and with anisaldehyde sulfuric acid reagent
Figure 4.12.1.38. TLC profile/pattern of Seetharama Watee extracted by methanol, toluene: ethyl acetate 9:1 (v/v) solvent system, detected under UV (254 nm), (366 nm) and with anisaldehyde sulfuric acid reagent

Figure 4.12.2.1. Comparison of \( R_f \) values of the authentically prepared samples, commercial samples of Maha Varthikava Watee, and betel samples under UV 254 nm (toluene : ethyl acetate, 9 : 1 v/v)

Figure 4.12.2.2. Comparison of \( R_f \) values of the authentically prepared sample, with the commercial samples of Maha Varthikava Watee, and betel sample in iodine vapour (toluene : ethyl acetate, 9 : 1 v/v)

Figure 4.12.2.3. Comparison of \( R_f \) values of the authentically prepared samples, with the commercial samples of Maha Varthikava Watee and betel sample with vanillin sulfuric acid reagent (toluene : ethyl acetate, 9 : 1 v/v)

Figure 4.12.2.4. Comparison of \( R_f \) values of the authentically prepared samples, with the commercial samples of Maha Varthikava Watee and betel sample with anisaldehyde sulfuric acid reagent (n-hexane : acetone, 3 : 1 v/v)

Figure 4.12.2.5. Comparison of \( R_f \) values of the authentically prepared samples, with the commercial samples of Maha Varthikava Watee and Indian privet sample under UV 254 nm (toluene: ethyl acetate, 9 : 1 v/v)
Figure 4.12.2.6. Comparison of $R_f$ values of the authentically prepared samples, with the commercial samples of Maha Varthikava Watee and Indian privet sample in iodine vapour (toluene: ethyl acetate, 9:1 v/v)

Figure 4.12.2.7. Comparison of $R_f$ values of the authentically prepared samples, with the commercial samples of Maha Varthikava Watee and Indian privet sample with vanillin sulfuric acid reagent (toluene: ethyl acetate, 9:1 v/v)

Figure 4.12.2.8. Comparison of $I_v$ values of the authentically prepared samples, with the commercial samples of Maha Varthikava Watee and Indian privet sample with anisaldehyde sulfuric acid reagent (n hexane: acetone, 3:1 v/v)

Figure 4.12.2.9. Comparison of $R_f$ values of the authentically prepared sample, with the commercial samples of Maha Varthikava Watee, and sour orange sample in iodine vapour (toluene: ethyl acetate 9:1 v/v)

Figure 4.12.2.10. Comparison of $R_f$ values of the authentically prepared samples, with the commercial samples of Maha Varthikava Watee and sour orange sample with vanillin sulfuric acid reagent (toluene: ethyl acetate 9:1 v/v)

Figure 4.12.2.11. Comparison of $R_f$ values of the authentically prepared samples, with the commercial samples of Maha Varthikava Watee, and fresh ginger and dry ginger with anisaldehyde sulfuric acid reagent (n hexane: acetone, 3:1 v/v)
Figure 4.12.2.12. Comparison of Rf values of the authentically prepared samples, with the commercial samples of Maha Varthikava Watee and asafoetida samples with anisaldehyde sulfuric acid reagent (n-hexane : acetone, 3 : 1 v/v)

Figure 4.13.2.13. Comparison of Rf values of the authentically prepared samples, with the commercial samples of Maha Varthikava Watee and iron wood flower stigma samples with anisaldehyde sulfuric acid reagent (n hexane : acetone, 3 : 1 v/v)

Figure 4.12.2.14. TLC profile/pattern of Maha Varthikava Watee extracted of n-hexane, toluene: ethyl acetate 9:1(v/v) solvent system detected under UV 254nm, 366nm and sprayed with anisaldehyde sulfuric acid reagent

Figure 4.12.2.15. TLC profile/pattern of of Maha Varthikava Watee, extracted of dichloromethane, toluene: ethyl acetate 9:1 (v/v) solvent system detected under UV light 254 nm and 366 nm and sprayed with anisaldehyde sulfuric acid reagent

Figure 4.12.2.16. TLC profile/pattern of Maha Varthikava Watee extracted of ethyl acetate, toluene: ethyl acetate 9:1 (v/v) solvent system, detected under UV light 254 nm and 366 nm and sprayed with anisaldehyde sulfuric acid reagent

Figure 4.12.2.17. TLC profile/pattern of Maha Varthikava Watee extracted of methanol, toluene: ethyl acetate 9:1 (v/v) solvent system, detect under UV light 254 nm and 366 nm and sprayed with anisaldehyde sulfuric acid reagent
Figure 4.14.1. HPL chromatogram of the Sample 1S₀
(acetonitrile: water 20: 30 v/v) 214

Figure 4.14.2. HPL chromatogram of the Sample 2S₀
(acetonitrile: water 20: 30 v/v) 216

Figure 4.14.3. HPL chromatogram of the Sample 3S₀
(acetonitrile: water 20: 30 v/v) 217

Figure 4.14.4. HPL chromatogram of the Sample 4S
(acetonitrile: water 20: 30 v/v) 218

Figure 4.14.5. HPL chromatogram of the Sample 5S
(acetonitrile: water 20: 30 v/v) 219

Figure 4.14.6. HPL chromatogram of the Sample 6S
(acetonitrile: water 20: 30 v/v) 221

Figure 4.14.7. HPL chromatogram of the Sample 7S
(acetonitrile: water 20: 30 v/v) 222

Figure 4.14.8. HPL chromatogram of the Sample 8S
(acetonitrile: water 20: 30 v/v) 224

Figure 4.14.9. Chemical Compounds Concentration of Prepared Samples of Seetharama - HPL Chromatogram 226

Figure 4.14.10. Chemical Compounds Concentration of Commercial Samples of Seetharama - HPL Chromatogram 227

Figure 4.14.11. HPL chromatogram of the Sample 1V₀
(acetonitrile: water 20: 30 v/v) 228

Figure 4.14.12. HPL chromatogram of the Sample 2V₀
(acetonitrile: water 20: 30 v/v) 229
Figure 4.14.13. HPL chromatogram of the Sample 3V₀
(acetonitrile: water 20: 30 v/v) 231

Figure 4.14.14. HPL chromatogram of the Sample of V₁
(acetonitrile: water 20: 30 v/v) 233

Figure 4.14.15. HPL chromatogram of the Sample V₂
(acetonitrile: water 20: 30 v/v) 235

Figure 4.14.16. HPL chromatogram of the Sample V₃
(acetonitrile: water 20: 30 v/v) 237

Figure 4.14.17. HPL chromatogram of the Sample V₄
(acetonitrile: water 20: 30 v/v) 239

Figure 4.14.18. HPL chromatogram of the Sample V₅
(acetonitrile: water 20: 30 v/v) 241

Figure 4.14.19. Chemical Compound Concentrations of Prepared Samples of Maha Varthikava - HPL Chromatogram 245

Figure 4.14.20. Chemical Compound Concentrations of Commercial Samples Of Maha Varthikava - HPL Chromatogram 246

Figure 4.16.1 Aspergillus (ІS₀) 266
Figure 4.16.2. Penicillum (ІV₀) 266
Figure 4.16.3. Curvularia (V₁) 266
Figure 4.16.4. Aspergillus (V₃) 267
Figure 4.16.5. Aspergillus (2V₀) 267
Figure 4.17.6. Mucor (S₅) 267
Figure 4.17.7. Penicillum (V₄) 267
Figure 4.16.8. Comparison of Colony diameter of the fungi in Seetharama Watee in Czapeck dox agar medium 268

Figure 4.16.9. Comparison of Colony diameter of the fungi in Maha Varthikava Watee in Czapeck dox agar medium 270

Figure 4.16.10. Comparison of Colony diameter of the fungi in Seetharama Watee in malt extract agar medium 272

Figure 4.16.11. Comparison of Colony diameter of the fungi in Maha Varthikava Watee in malt extract agar medium 274

Figure 4.17.1. TLC for the detection of aflatoxin in Seetharama Watee samples and standard aflatoxin samples chloroform: acetone (9: 1 v/v) solvent system and detected under long wave UV light 364 nm 276

Figure 4.17.2. TLC for the detection of aflatoxin in Maha Varthikava Watee samples and standard aflatoxin samples chloroform: acetone (9: 1 v/v) solvent system and detected under long wave UV light 364 nm 277

Figure 4.17.3. TLC for the detection of aflatoxin in Seetharama Watee samples and standard aflatoxin samples, chloroform: acetone (9:1 v/v) solvent system and sprayed with 25% H₂SO₄ and examined under UV light 364 nm 278

Figure 4.17.4. TLC for the detection of aflatoxin in Maha Varthikava Watee samples and standard aflatoxin samples, chloroform: acetone (9: 1 v/v) solvent system and sprayed with 25% H₂SO₄ and detected under UV light 364 nm 279
Figure 4.17.5. Two-dimensional TLC fingerprint of the Seetharama Watee
samples chloroform: acetone (9:1 v/v) &
toluene: ethyl acetate: 90% formic acid (5:4:1 v/v)
solvent systems (1S0, S2 and S5) 281

Figure 4.17.6. Two-dimensional TLC fingerprint of the Seetharama Watee
samples chloroform: acetone (9:1 v/v) &
toluene: ethyl acetate: 90% formic acid (5:4:1 v/v) solvent
systems (1S0, S2 and S5) after spraying with 25% H2SO4 283

Figure 4.17.7. Two-dimensional TLC fingerprint of the Maha Varthikava
Watee samples chloroform: acetone (9:1 v/v) &
toluene: ethyl acetate: 90% formic acid (5:4:1 v/v)
solvent systems (V4 and V5) 285

Figure 4.17.8. Two-dimensional TLC fingerprint of the Maha Varthikava Watee
samples chloroform: acetone (9:1 v/v) &
toluene: ethyl acetate: 90% formic acid (5:4:1 v/v) solvent
systems (V4 and V5) after spraying with 25% H2SO4 286

Figure 7.v.i Seetharama 254nm 338
Figure 7.v.ii iodine vapor 338
Figure 7.v.iii vanillin sulphate 338
Figure 7.v.iv TLC profiles/patterns of Seetharama and holy basil
detected under visual light 254 nm UV light 338
Figure 7.v.v TLC profiles/patterns of Seetharama and holy basil in
iodine vapour and with vanillin sulphate spray 339
Figure 7.v.vi TLC profiles/ patterns of Seetharama and Red Sandalwood detected under 254 nm and 366 nm UV lights

Figure 7.v.vii TLC profiles/ patterns of Seetharama and Red Sandalwood in iodine vapour and with vanillin sulphate spray

Figure 7.v.viii TLC profiles/ patterns of Seetharama and Sour Orange detected under 254nm UV light, iodine vapour and vanillin sulphate spray

Figure 7.v.ix TLC profiles/ patterns of Seetharama Indian privet, ginger and Cinnomon sedge detected under visual light and 254 nm UV light

Figure 7.v.x TLC profiles/ patterns of Seetharama, Indian privet, Ginger and Cinnomom sedge in iodine vapour and with vanillin sulphate spray

Figure 7.v.xi TLC profiles/ patterns of Maha Varthikava and betel detected under visual light and 254nm UV light

Figure 7.v.xii TLC profiles/ patterns of Maha Varthikava and Betel in iodine vapour and with vanillin sulfuric acid spray

Figure 7.v.xiii TLC profiles/ patterns of Maha Varthikava and Indian privet 254nm UV, iodine vapour and with vanillin sulphate spray

Figure 7.v.xiv TLC profiles/ patterns of Seetharama, Garlic, Red Sandalwood, Asafoeteda and Cinnamon sedge samples detected under visual light
Figure 7.v.xv TLC profiles/ patterns of Seetharama, Holy basil, Neem, Indian privet, Ginger, and Sour Orange samples detected under visual light 344

Figure 7.v.xvi TLC profiles/ patterns of Maha Vartikava, Betel, Indian privet, fresh Ginger, Iron wood and dry Ginger samples detected under visual light 344

Figure 7.v.xvii TLC profiles/ patterns of Maha Vartikava, Asafoeteda, dry Ginger, Indian privet, Iron wood and fresh and Ginger samples detected under visual light 345

Figure 7.v.xviii TLC profiles/ patterns of Seetharama, Garlic, Red Sandalwood, Asafoeteda and Cinnamon sedge samples detected under 254 nm UV light 345

Figure 7.v.xix TLC profiles/ patterns of Seetharama, Holy basil, Neem, Indian privet, Ginger, and Sour Orange samples detected under 254 nm UV light 346

Figure 7.v.xx TLC profiles/ patterns of Maha Vartikava, Betel, Indian privet, fresh Ginger, Bees’s honey and dry Ginger samples detected under 254 nm UV light 346

Figure 7.v.xxii TLC profiles/ patterns of Maha Vartikava, Asafoeteda, dry Ginger, Indian privet, Iron wood and fresh Ginger samples detected under 254 nm UV light 347

Figure 7.v.xxii TLC profiles/ patterns of Seetharama, Garlic, Red Sandalwood, Asafoeteda and Cinnamon sedge samples detected under 366 nm UV light. 347
Figure 7.v.xxiii TLC profiles/patterns of Seetharama, Holy basil, Neem, Indian privet, Ginger and Sour Orange samples detected under 366 nm UV light 348

Figure 7.v.xxiv. TLC profiles/patterns of Maha Vartikava, Betel, Indian privet, fresh Ginger, Bee's honey and dry Ginger samples detected under 366 nm UV light 348

Figure 7.v.xxv. TLC profiles/patterns of Maha Vartikava, Asafoetida, dry Ginger, Indian privet, Iron wood and fresh Ginger samples detected under 366 nm UV light 349

Figure 7.v.xxvi TLC profiles/patterns of Seetharama, Garlic, Red Sandalwood, Asafoetida and Cinnamon sedge samples after spraying anisaldehyde in sulfuric acid 349

Figure 7.v.xxvii TLC profiles/patterns of Seetharama, Holy basil, Neem, Indian privet, Ginger, and Sour Orange samples after spraying anisaldehyde in sulfuric acid 350

Figure 7.v.xxviii TLC profiles/patterns of Maha Vartikava, Betel, Indian privet, fresh Ginger, Bee's honey and dry Ginger samples after spraying anisaldehyde in sulfuric acid 350

Figure 7.v.xxix TLC profiles/patterns of Maha Vartikava, Asafoetida, dry Ginger, Indian privet, Iron wood and fresh Ginger samples after spraying anisaldehyde in sulfuric acid 351

Figure 7.v.xxx UV Spectrophotometer (UV mini 1240) 351

Figure 7.v.xxxi UV absorption spectrum of 1S0 352

Figure 7.v.xxxii UV absorption spectrum of 2S0 352
Figure 7. v. xxxiii UV absorption spectrum of $3s_0$ 352
Figure 7.v.xxxiv UV absorption spectrum of $s_1$ 353
Figure 7.v. xxxv UV absorption spectrum of $s_2$ 353
Figure 7.v.xxxvi UV absorption spectrum of $s_3$ 353
Figure 7.v.xxxvii UV absorption spectrum of $s_4$ 354
Figure 7.v.xxxviii UV absorption spectrum of $s_5$ 354
Figure 7.v.xxxix UV absorption spectrum of $1v_0$ 355
Figure 7.v.xl UV absorption spectrum of $2v_0$ 355
Figure 7.v.xli UV absorption spectrum of $3v_0$ 355
Figure 7.v.xlii UV absorption spectrum of $v_1$ 356
Figure 7.v.xliii UV absorption spectrum of $v_2$ 356
Figure 7.v.xliv UV absorption spectrum of $v_3$ 356
Figure 7.v.xlv UV absorption spectrum of $v_4$ 357
Figure 7.v.xlvi UV absorption spectrum of $v_5$ 357
Abbreviations

SW-Seetharama Watee  
1S₀ authentically prepared Seetharama sample 1  
2S₀ authentically prepared Seetharama sample 2  
3S₀ authentically prepared Seetharama sample 3  
S₁ Commercial Seetharama sample 1  
S₂ Commercial Seetharama sample 2  
S₃ Commercial Seetharama sample 3  
S₄ Commercial Seetharama sample 4  
S₅ Commercial Seetharama sample 5  
1V₀ authentically prepared Maha Varthikava sample 1  
2V₀ authentically prepared Maha Varthikava sample 2  
3V₀ authentically prepared Maha Varthikava sample 3  
V₁ Commercial Maha Varthikava sample 1  
V₂ Commercial Maha Varthikava sample 2  
V₃ Commercial Maha Varthikava sample 3  
V₄ Commercial Maha Varthikava sample 4  
V₅ Commercial Maha Varthikava sample 5  

VW-Maha Varthikava Watee
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In present context, standardization of herbal drugs is a crucial issue in herbal drug industry as there are unauthentic counterparts found in the market. Seetharama Watee (SW) and Maha Varthikava Watee (MV) are two effective herbo mineral and poly herbal drugs, recorded in Sri Lankan ancient text Watika Prakaranaya published in 1879. SW contains 28 herbs and 9 minerals and mainly effective on febrile illnesses while the MV contains 29 herbs, and very effective in curing digestive tract disorders.

As commercially available products may have not been prepared according to the authentic formulas, their efficacy would not be the same as that of the authentic formulas. This work aimed at generating physico-chemical, spectrophotometric and chromatographic fingerprints for the standardization of these two drugs to confirm their authenticity. Following the authentic formulas, the pills of two drugs SW and MV have been prepared. In the preparation of SW, the powdered herbs and minerals were mixed thoroughly and ground for 7 days using 5 herbal juice extracts and 2 oils. In the preparation of MV, all herbs were purified and finely powdered and mixed thoroughly and ground using 3 juice extracts and bee’s honey. These pills were made to the size of a green gram grain and dried under shade. Three batches of the two formulations were prepared to account for seasonal changes and were compared with five commercial samples. The quality test for purity and test for the identity were considered as tools for the standardization. One way ANOVA followed by the Dunnett t-test was used in the analysis of data at 0.05 significant level. The SPSS statistical package was used for this data analysis. When considering the variation of the weight of prepared pills, the mean
weight of SW and MV 10 pills were 1.3±0.04 g and 1.2±0.06 g respectively. pH of the 10% aqueous solutions of two preparations were 5.4±0.15 and 4.6±0.07 respectively, the mean specific gravity of the mean values were 1.2±0.01 and 1.2±0.03, the mean values of weight loss on drying were 9.3±0.97 g and 12.3±0.48 g respectively. In ash content, the mean values were 10.1±0.59 g and 6.8±0.17 g respectively. The mean values of acid insoluble ash of the two formulations were 0.49±0.03 g and 0.09±0.07 g. When considering the crude fiber the mean values were 7.9±1.01 g and 8.4±1.8 g. Mean values of the disintegration time, friability and hardness of SW were 21.7±3.61 min, 0.77± 0.1%, and 1.3±0.08 kg/cm² while for MV they were 30.5±2.8 min, 1.1±0.08% and 0.78±0.12 kg/cm². Mean weight of the drug extract (residues) of hexane, dichloromethane, ethyl acetate and methanol of SW were 26.5±1.4% w/w, 2.4±0.03% w/w, 1.5±0.18% w/w, 8.4±1.5% w/w and 6.1±0.84% w/w, 1.7±0.2% w/w, 2.2±0.52% w/w, 15.3±4.4% w/w for MV respectively. When comparing the authentically prepared samples with the commercial counterparts using the above mentioned parameters, some samples were significantly different whereas others were not at the level of 0.05 In the IMVIC test, the microbial content of both preparations were less than the WHO recommended level. The TLC fingerprints of some raw materials were interconnected with these formulations. Aflatoxins were not present in any of the two preparations. Hg and As were present in standard levels and Pb and Cd levels were under the levels WHO recommendation limits in SW. In MV, all heavy metal contents were under the WHO recommendations. The λₘₐₓ of uv/vis spectrum of SW was 287 nm; 287 nm and 345 nm for MV. Five peaks in the SW and seven peaks in the MV were identified in the HPLC fingerprints of the authentic samples. Hence, SW and MV can be standardized using the above mentioned measurements.