

Some Agronomical, Taxonomical and Chemical aspects of

***Plectranthus zeylanicus* (Benth.) and *Plectranthus amboinicus* (Lour.)**

in family Lamiaceae

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The work described in this thesis was carried out by me under the supervision of Mr. R.M. Dharmadasa, Dr.G.A.S Premakumara (Industrial Technology Institute) and Dr. (Mrs.) C.D. Jayaweera (University of Sri Jayawardanapura) and this has not been submitted to any other university for another degree.

22.06.2010.....



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We certify that the above statement made by the candidate is true and that the thesis is suitable for submission to the university for the purpose of evaluation.

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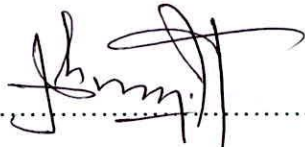


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ABSTRACT

Plectranthus zeylanicus Benth. (Sinhala Iriveriya) and *Plectranthus amboinicus* Lour. (Sinhala Kapparawalliya) are industrially important widely used medicinal plants belonging to genus *Plectranthus* in family Lamiaceae and hence most of the phenotypic characters are similar. Both of these plants have been widely used in traditional and Ayurveda systems of medicine to treat an array of ailments since ancient times with less / no side effects. Moreover, there are more than 50 recipes in Ayurveda pharmacopoeia, which contained these plants as a major ingredient. Although *Plectranthus zeylanicus* and *Plectranthus amboinicus* have been extensively used in traditional and Ayurvedic medicine, there is no organized cultivation/s in the country to meet the existing raw material requirement due to lack of tested information on agro technology and correct identification. In the present study, attempts have been made to study the major yield components of plant height, plant spreading, number of shoots per plant, plant fresh weight, plant dry weight, fresh to dry weight ratio for the higher economical yield and essential oil content and composition for chemical yield were investigated. It was found that all physical and chemical parameters were optimum at fully matured stage and the essential oil content was varied as leaf < stem < root. The highest content of p-cymene, Geraniol and Geranyl acetate were observed at the age of 4 months.

In addition to the general morphological data, Thin Layer Chromatographic profiles (TLC), Gas Chromatographic profiles (GC), and powder microscopy was incorporated for the correct identification of *Plectranthus zeylanicus* and *Plectranthus amboinicus*. Present study highlighted many distinguished polymorphic phenotypic characters such as colour of the stem, internodal distance, shape of the stem, petiole colour, presence of a groove in the petiole, petiole length, colour of the ventral and dorsal surfaces of the leaf, leaf margin, leaf apex, leaf texture and

thickness of fresh leaves for the correct identification of two species. Further presence of thickened wall cork fragments, outer surface wavier subsidiary cells around the stomata were observed in *Plectranthus amboinicus*. Moreover, some distinguishing characters with chemotaxonomic significance were observed in TLC profiles of dichloromethane extracts and essential oil fraction and GC profiles of essential oil of different parts of *Plectranthus zeylanicus* and *Plectranthus amboinicus*. Based on all above factors it could be concluded that both *Plectranthus* species should be harvested at fully matured stage and correct identification could be done by observing polymorphic phenotypic characters, powder microscopy, GC profiles and TLC fingerprints. The results of present study could be directly incorporated for the preparation of quality standards for *Plectranthus zeylanicus* and *Plectranthus amboinicus*.

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TABLE OF CONTENT

	Page no.
Abstract	iii
Acknowledgement	v
Table of contents	vii
List of tables	xi
List of figures	xiii
Abbreviations	xvi
1. Introduction	1
2. Literature review	4
2.1. General character of Genus <i>Plectranthus</i>	4
2.2. Distribution and general uses of Genus <i>Plectranthus</i>	4
2.3. Chemistry of Genus <i>Plectranthus</i>	5
2.4. <i>Plectranthus amboinicus</i> (Lour.)	8
2.4.1. Classification of <i>Plectranthus amboinicus</i>	8
2.4.2. Synonyms and vernacular names	8
2.4.3. Botany of the <i>Plectranthus amboinicus</i>	9
2.4.4. Distribution of <i>Plectranthus amboinicus</i>	9
2.4.5. Agronomy of <i>Plectranthus amboinicus</i>	10
2.4.6. Medicinal uses of <i>Plectranthus amboinicus</i>	10
2.4.6.1. Digestive system conditions	10

2.4.6.2. Skin conditions	10
2.4.6.3. Respiratory conditions	11
2.4.6.4. Infection and fever	11
2.4.6.5. Genito urinary condition	11
2.4.6.6. Other medicinal condition	12
2.4.6.7. Other uses (non medicinal)	12
2.5. <i>Plectranthus zeylanicus</i> (Benth.) Roxb	12
2.5.1. Classification of <i>Plectranthus zeylanicus</i> (Benth.) Roxb	12
2.5.2. General botany of the <i>Plectranthus zeylanicus</i> (Benth.)	13
2.5.3. Plant description	13
2.5.4. Distribution of <i>Plectranthus zeylanicus</i>	14
2.5.5. Agronomy of the <i>Plectranthus zeylanicus</i>	14
2.5.6. Medicinal use of <i>Plectranthus zeylanicus</i>	14
2.5.7. Uses described in other text books	18
2.6. Chemical analysis	18
2.6.1. Distillation and quantification of essential oils	18
2.6.2. Methods used in identification of constituents present in essential oil	18
2.6.3. Thin Layer Chromatography (TLC)	19
2.7.1. Pharmacognosy of family Lamiaceae.	20

3.0 Materials and Methods.

3.1 Agronomic study of <i>Plectranthus zeylanicus</i> and <i>Plectranthus amboinicus</i> .	21
3.1.1 Cultivation site	21
3.1.2 Land preparation	21
3.1.3 Planting material	21
3.1.4 Field establishment and maintenance	22
3.1.5 Data collection	22
3.2 Chemical analysis	22
3.2.1. Determination of moisture content	22
3.2.1.1. Moisture balance method	22
3.2.1.2. Toluene distillation method	23
3.2.2. Distillation of essential oil	23
3.2.3. Analysis of essential oil	24
3.3 Thin Layer Chromatography	24
3.3.1. Extraction of samples for Thin Layer Chromatography	24
3.3.2 Preparation of the plates and application of samples	25
3.3.3. Development and observation of chromatograms	25
3.3.4. Calculation of R_f values	26
3.4. Microscopic study of the anatomy of <i>Plectranthus zeylanicus</i> and <i>Plectranthus amboinicus</i>	26
3.4.1. Preparations of Chloral hydrate Test Solution (TS)	26

3.4.2. Anatomical study	26
3.4.3. Powder microscopic analysis of <i>Plectranthus zeylanicus</i> and <i>Plectranthus amboinicus</i>	27
4.0 Results	
4.1 Agronomical study of <i>Plectranthus zeylanicus</i> and <i>Plectranthus amboinicus</i>	28
4.2. Determination of essential oil content	32
4.3. Essential oil composition of both <i>Plectranthus zeylanicus</i> and <i>Plectranthus amboinicus</i>	33
4.4. Thin Layer Chromatography of <i>Plectranthus zeylanicus</i> and <i>Plectranthus amboinicus</i>	42
4.5. Comparison of morphological features of <i>Plectranthus zeylanicus</i> and <i>Plectranthus amboinicus</i>	54
4.6. Comparison of anatomical features and powder microscopic study of <i>Plectranthus zeylanicus</i> and <i>Plectranthus amboinicus</i>	56
5.0 Discussion	59
6.0 Conclusion/s	63
7.0 References	64

LIST OF TABLES

	Page no
Table 2.1 Percentage composition of the volatile concentrates of <i>Coleus aromaticus</i>	6
Table 2.2 Main Ayurveda formula containing <i>Plectranthus zeylanicus</i> and main uses	15
Table 4.1 Essential oil content of different parts of <i>Plectranthus zeylanicus</i> and <i>Plectranthus amboinicus</i> with maturity	32
Table 4.2 Constituents present in leaf essential oil of <i>Plectranthus zeylanicus</i> and <i>Plectranthus amboinicus</i> at different time intervals	37
Table 4.3 Constituents present in root essential oil of <i>Plectranthus zeylanicus</i> and <i>Plectranthus amboinicus</i> at different time intervals	39
Table 4.4 Constituents present in stem essential oil of <i>Plectranthus zeylanicus</i> and <i>Plectranthus amboinicus</i> at different time intervals	40
Table 4.5 Comparison of R_f values with their colours in TLC profile of leaves Essential oil of <i>Plectranthus zeylanicus</i> and <i>Plectranthus amboinicus</i>	43
Table 4.6 Comparison of R_f value with their colours in TLC profile of leaves extraction of <i>Plectranthus zeylanicus</i> and <i>Plectranthus amboinicus</i>	44
Table 4.7 Comparison of R_f values with their colours in TLC profile of stem essential oil of <i>Plectranthus zeylanicus</i> and <i>Plectranthus amboinicus</i>	46
Table 4.8 Comparison of R_f values with their colours in TLC profile of stem extracts of <i>Plectranthus zeylanicus</i> and <i>Plectranthus amboinicus</i>	47
Table 4.9 Comparison of R_f values with their colours in TLC profile of root essential oil of <i>Plectranthus zeylanicus</i> and <i>Plectranthus amboinicus</i>	49

Table 4.10	Comparison of R_f values with their colours in TLC profile of root extracts of <i>Plectranthus zeylanicus</i> and <i>Plectranthus amboinicus</i>	50
Table 4.11	Comparison of R_f values with their colours in TLC profile of whole plant essential oil of <i>Plectranthus zeylanicus</i> and <i>Plectranthus amboinicus</i>	52
Table 4.12	Comparison of R_f values with their colours in TLC profile of whole plant extracts of <i>Plectranthus zeylanicus</i> and <i>Plectranthus amboinicus</i>	53
Table 4.13	Prominent morphological characters of <i>Plectranthus zeylanicus</i> and <i>Plectranthus amboinicus</i>	55

LIST OF FIGURES

- Figure 4.1 Comparison of basic growth and yield parameters of *Plectranthus zeylanicus* and *Plectranthus amboinicus* with time [A= Plant height; B = Plant spreading; C= Number of shoots/branches; D =Plant fresh weight; E= Plant dry weight; F= Plant fresh to dry weight ratio] 28
- Figure 4.2 Extrapolated fresh yields of *Plectranthus zeylanicus* and *Plectranthus amboinicus* at different growth stages 30
- Figure 4.3 Extrapolated dry yields of *Plectranthus zeylanicus* and *Plectranthus amboinicus* at different growth stages 30
- Figure 4.4 *Plectranthus zeylanicus* and *Plectranthus amboinicus* field beds cultivated for the present study at ITI premises [A= Fully matured plant bed of *Plectranthus zeylanicus*, B= Fully matured plant bed of *Plectranthus amboinicus*, C= harvested *Plectranthus zeylanicus* bed and D= harvested *Plectranthus amboinicus* bed] 31
- Figure 4.5 Variation of 3 compounds of leaf essential oil of *Plectranthus zeylanicus* and *Plectranthus amboinicus* at different maturity stages [PC= p- cymene, G= Geraniol, GA= Geranyl acetate, Pz=*Plectranthus zeylanicus*, Pa=*Plectranthus amboinicus*] 34
- Figure 4.6 Variation of 3 compounds of stem essential oil of *Plectranthus zeylanicus* and *Plectranthus amboinicus* at different maturity stages [PC= p- cymene, G= Geraniol, GA= Geranyl acetate, Pz=*Plectranthus zeylanicus*, Pa=*Plectranthus amboinicus*] 35

Fig. 4.7 Variation of 3 compounds of root essential oil of *Plectranthus zeylanicus* and *Plectranthus amboinicus* at different maturity stages [PC= p- cymene, G= Geraniol, GA= Geranyl acetate, Pz=*Plectranthus zeylanicus*, Pa= *Plectranthus amboinicus*] 36

Figure 4.8 Thin Layer Chromatogram of leaf essential oil(A) and dichloromethane solvent Extracts(B) of *Plectranthus zeylanicus* and *Plectranthus amboinicus* visualized by spraying Vanillin- sulphuric acid. (PZ= *Plectranthus zeylanicus*, PA= *Plectranthus amboinicus*; C =Commercial sample the number of each code represent the age of the plant in months) 42

Figure 4.9 Thin Layer Chromatogram of stem essential oil(C) and dichloromethane solvent Extracts(D) of *Plectranthus zeylanicus* and *Plectranthus amboinicus* visualized by spraying Vanillin- sulphuric acid. (PZ= *Plectranthus zeylanicus*, PA= *Plectranthus amboinicus*; C= Commercial sample the number of each code represent the age of the plant in months) 45

Figure 4.10 Thin Layer Chromatogram of root essential oil(E) and dichloromethane solvent extract(F) of *Plectranthus zeylanicus* and *Plectranthus amboinicus* visualized by spraying Vanillin- sulphuric acid. (PZ= *Plectranthus zeylanicus*, PA= *Plectranthus amboinicus*; C= Commercial sample. Number of each code represent the age of the plant in months) 48

Figure 4.11 Thin Layer Chromatogram of whole plant essential oil (left) and dichloromethane solvent extracts (right) of *Plectranthus zeylanicus* and *Plectranthus amboinicus* visualized by spraying Vanillin- sulphuric acid [WPEOPZ=

- Whole plant essential oil of *Plectranthus zeylanicus* , WPEOPA =Whole plant essential oil of *Plectranthus amboinicus*; WPDEPZ= Whole plant solvent extract of *Plectranthus zeylanicus*, WPDEPA=Whole plant Solvent extract of *Plectranthus amboinicus*] 51
- Figure. 4.12 Comparison of morphological features of *Plectranthus zeylanicus* (left) and *Plectranthus amboinicus* (right) 54
- Figure. 4.13 *Plectranthus amboinicus* branch grown in dry conditions at Giradurukotte 54
- Figure.4.14 some anatomical differences of *Plectranthus zeylanicus* and *Plectranthus amboinicus* (A=oil gland of *Plectranthus zeylanicus*, A1=oil gland of *Plectranthus amboinicus*, B= Glandular hairs of *Plectranthus zeylanicus* B1=Glandular hairs of *Plectranthus amboinicus*, C=Stomata of *Plectranthus zeylanicus*, C1= Stomata of *Plectranthus amboinicus*) 56
- Figure 4.15 Transvers Section(TS) of Stems of *Plectranthus zeylanicus* and *Plectranthus amboinicus* (T=Trichome, E=Epidermis, GT= Glandular trichomes, VB=Vascular bundles) 57
- Figure.4.16 Powder microscopy of *Plectranthus zeylanicus* and *Plectranthus amboinicus* [1a & b =stomata, 2a & b.=Multicellular trichomes, 3 a & b= cork tissues, 4 a &b= Oil glands, 5a & b=glandular multicellular trichomes (x 40)] 57