



Pieter Rihi Kale (Autor)

# **Studies on Nutritional and Processing Properties of Storage Roots of Different Yam Bean (*Pachyrhizus* spp.) and Wild Mung Bean (*Vigna vexillata*) Species**

Pieter Rihi Kale

---

**Studies on Nutritional and Processing Properties of Storage Roots of Different Yam Bean (*Pachyrhizus* spp.) and Wild Mung Bean (*Vigna vexillata*) Species**

---



Cuvillier Verlag Göttingen

<https://cuvillier.de/de/shop/publications/2249>

Copyright:

Cuvillier Verlag, Inhaberin Annette Jentsch-Cuvillier, Nonnenstieg 8, 37075 Göttingen, Germany

Telefon: +49 (0)551 54724-0, E-Mail: [info@cuvillier.de](mailto:info@cuvillier.de), Website: <https://cuvillier.de>

## Table of contents

	Page
<b>List of Tables</b>	v
<b>List of Figures</b>	vii
<b>List of Photos</b>	ix
<b>List of Abbreviations, Symbols and Units</b>	x
<b>1. General Introduction</b>	
1.1. Background	1
1.2. Botanical description and distribution	3
1.3. Pruning and yield potential	3
1.4. Utilization	5
1.5. Objectives	8
1.6. References	9
<b>2. Chemical Composition and Nutritional Potential of Storage Roots of Yam Bean (<i>Pachyrhizus spp.</i>) Grown in Indonesia</b>	
2.1. Abstract	12
2.2. Introduction	13
2.3. Materials and Methods	14
2.3.1. Materials and the preparation process	14
2.3.2. Determination of the chemical composition	16
2.3.2.1. Storage roots yield and dry matter	16
2.3.2.2. Protein	17
2.3.2.3. Amino acids	17
2.3.2.4. Starch	18
2.3.2.5. Sugars	18
2.3.2.6. Amylose and amylopectin	19
2.3.2.7. Minerals	20
2.3.2.8. Ascorbic acid	21
2.3.2.9. Total dietary fiber	21
2.3.2.10. Statistical analysis	22
2.4. Results and Discussion	22
2.4.1. Yield and dry matter	22
2.4.2. Protein	27
2.4.3. Amino acids	30
2.4.4. Starch	35
2.4.5. Sugars	38
2.4.6. Amylose and amylopectin	40
2.4.7. Minerals	42
2.4.8. Ascorbic acid	50
2.4.9. Total dietary fiber	52

2.4.10.	Conclusion	53
2.4.11.	References	54
<b>3.</b>	<b>Pasting Properties and Freeze-Thaw Stability of Flour Obtained From Storage Roots of Yam Bean (<i>Pachyrhizus spp.</i>) Grown in Indonesia</b>	
3.1.	Abstract	57
3.2.	Introduction	58
3.3.	Materials and Methods	60
3.4.	Results and Discussion	63
3.5.	Conclusion	76
3.6.	References	77
<b>4.</b>	<b>Alternative Utilization of Flour Obtained From Yam Bean Storage Roots in Different Wheat Flour- Based Food Products</b>	
4.1.	Abstract	79
4.2.	Introduction	80
4.3.	Materials and Methods	81
4.4.	Results and Discussion	85
4.5.	Conclusion	96
4.6.	References	97
<b>5.</b>	<b>Nutritional Potential and Starch Properties of Storage Roots of Wild Mung Bean [<i>Vigna vexillata</i> (L.) A. Rich] From Bali – Indonesia</b>	
5.1.	Abstract	97
5.2.	Introduction	98
5.3.	Materials and Methods	101
5.4.	Results and Discussion	105
5.5.	Conclusion	108
5.6.	References	108
<b>6.</b>	<b>Concluding Summary</b>	<b>110</b>
	<b>Acknowledgement</b>	<b>113</b>
	<b>Curriculum vitae</b>	<b>114</b>