

CHARACTERIZATION OF RICE AND
RICE STARCH OF DIFFERENT
CULTIVARS

BY

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TECHNOLOGY

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“I declare that this thesis submitted by me for MSc. degree in Food Science and Technology at the University of Sri Jayewardenepura. This thesis contains no material that has been submitted previously, in whole or in part, for the award of any other academic degree or diploma. Except where otherwise indicated, this thesis is my own work”

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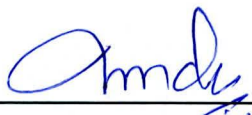
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DEDICATION

I dedicate this to my family, supervisors, friends and fellow members without whom it was almost impossible for me to complete my thesis work.

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LIST OF ABBRIVIATIONS

FAO	Food and Agriculture Organization
ANOVA	Analysis of Variance
AOAC	Association of Official Analytical Chemists
DMRT	Duncan's Multiple Range Test
IRRI	International Rice Research Institute
B.C	Before Christ
DNS	Dinitrosalicylic acid
At	Ambalangoda
Bg	Bathalagoda
PB	Protein Body
CRH	Carbonized Rice Husk
RHA	Rice Husk Ash
KI	Potassium Iodide
NaOH	Sodium Hydroxide
KOH	Potassium hydroxide
CuSO ₄	Copper Sulphate
K ₂ SO ₄	Potassium Sulphate
HCl	Hydrochloric acid
DF	Dietary Fiber
RS	Resistant starch

ABSTRACT

This study was carried out to find the physical, chemical characteristics of rice and rice starch of traditional and improved rice cultivars namely Motaikarupan, Morungan, Pachachperumal, Suwenthal, Pusparaga, Atakari, BG300, At308, BG406, BG250. The proximate composition for the ten varieties were variable with respective ranges being moisture 13.390% to 9.460%, total sugar 86.45% to 79.45%, crude protein 8.15 % to 5.79 %, total fat 3.5400% to 2.2150%, resistant starch 0.69% to 0.405%, ash 1.6900% to 0.8950%, Dietary fiber 4.10% to 2.20%. All these result were found to be significantly different ($P < 0.05$). The starch properties including amylose content, water solubility, swelling power and water binding capacity were estimated for ten rice varieties, varied from 30.8010% to 23.2005%, 8.4695% to 4.7900%, 12.57% to 10.2300%, 3.1028% to 2.4400%, respectively ($P < 0.05$). Analysis of milling quality parameters of the eight rice varieties were showed that there is a significant different ($P < 0.05$). The husk content 21.0101% to 18.4601%, bran content 10.5495% to 6.5575%, total recovery 73.3290% to 67.8850%, head rice 67.5902% to 22.9010%, broken rice 67.2780% to 5.2500%. The physical properties of rough rice and brown rice were analyzed. According to rough rice length the rice varieties were classified into three groups, long (1 variety), medium (5 varieties) and short (2 varieties) and they were further classified based on their width rough rice were classified into two groups as semi spherical (3 varieties), semi long (5 varieties). With brown rice length the rice varieties were grouped into two groups as medium (6 varieties) and short (2 varieties) and also grouped in three based on the length to width ratio as slender (2 varieties), medium (5 varieties) and bold (1 variety). Based on the thousand rough rice weights, the varieties were categories into 7 ranges; below 15grams (1 variety), 15-18grams (2 varieties), 18 to 21grams (1 varieties), 21 to 24grams (1 variety), 24 to 27 (1 variety), 27 to 30 (1 Variety), 33 to 36 (1 variety) and the brown rice were also grouped into 5 according to their thousand grain weight ranges; below

15 grams (1 variety), 15 to 18 grams (2 varieties), 18 to 21 grams (2 varieties), 21 to 24 (1 variety), 24 to 27 (2 varieties). Bulk density of the rough rice were ranged from 0.6615g/ml to 0.6110g/ml ($P < 0.05$). The hardness of rough rice and brown rice were stated 112N to 51.6N and 46.6N to 20.4N respectively. The color of brown rice stated according to L^* , a^* and b^* values, 62.453 to 44.230 ($p < 0.05$), 9.597 to 0.640 ($p < 0.05$), 17.927 to 10.860 ($p > 0.05$) respectively and the color of polished rice L^* value was ranged from 71.63 to 68.29 ($p < 0.05$)