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Research Article

Quality Parameters of different Varieties of Paddy Rice grown in Vadakkanchery, Kerala.

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ABSTRACT

The quality parameters of three varieties of paddy rice were grown in Vadakkanchery, Kerala. The samples were obtained from farmers. They were analyzed for Moisture content, Percentage dockage, Percentage discoloured, Percentage damage grains and Grain dimension. The results showed that there was no significant difference between the moisture content of the three varieties of paddy collected. Dockage in paddy is high in uma variety as compared to other varieties. The level of damaged kernels and discolored kernels were relatively low and showed no significant difference. It was therefore concluded that all the varieties have one defects or the other and needs to be improved on to meet international standard.

Key words: Rice Varieties, Moisture, Discoloured, Damage grains

INTRODUCTION

Rice is the most important staple food in Asia. More than 90% of the world's rice is grown and consumed in Asia, where 60% of the world's population lives. Rice accounts for between 35-60% of the caloric intake of three billion Asians[1]. Rice is primarily a high energy calorie food. It consist of carbohydrate in the form of starch which is about 72 -75 % of the total grain composition, 4 % phosphorus and some enzymes. The protein of rice contains glutein, which is also known as oryzenin. The nutritive value of rice protein is much higher than that of wheat, maize or other cereals. Rice contains most of the minerals mainly located in the pericarp[2].

Rice has potential wide range of food categories. Besides having nutritional and medicinal benefits, the by - product of rice are equally important and beneficial. Some of the rice by – products are rice husks, rice bran, broken rice, rice flour, rice milk, rice pudding, rice starch, rice pudding, rice starch, rice straw, rice beverage, rice paper, rice glue, rice cakes, rice vinegar, rice soya milk, rice yeast and rice based food products[3].

Rice is marketed according to three grain size and shape classes (long, medium and short). Kernel dimension are primary quality factors in most phase of processing, drying, handling equipment, breeding and grading. Grain size and shape are the first quality characteristics considered in developing new varieties [4].Quality is not always easy to define as it depends on the consumers and the intended end use for the grain. A quality grain is that which meets the end user specifications with respect to range of predetermined quality and safety standards. In addition, rice production and marketing in the country contribute to food security, job creation, poverty reduction and national productivity [5]. In order to add to the growing body of knowledge on physical quality of paddy and processed rice produced in Vadakkanchery, Kerala.

MATERIALS AND METHOD

Survey and collection of samples

Agricultural department, Krishibhavan was visited to get the common and technical names and varieties of paddy grown in Palakkad district (Vadakkanchery) of Kerala. Each of the varieties (Uma, Ponnmani and White ponni) were collected from the local farmers and analysed for moisture content, dockage, discoloured grain, broken or damaged grain and grain dimension.

Analysis

Moisture Content Percentage

Moisture content (MC) is the weight of water contained in paddy expressed in percentage. Moisture content is measured using oven method. The oven is set up at 130°c then the three varieties of paddy is weighed and placed inside the oven. Then the final weight of the sample is measured after 16 hours.

$$MC_{db} = \frac{m_i - m_f}{m_f} \times 100$$

MC_{db} = moisture content dry basis
m_i = initial weight
m_f = final weight

Dockage in paddy

The light foreign matter, stones, weeds and seeds from a 100 gm sample were removed. The total weight was obtained and then the dockage percentage was calculated as follows:

$$\% \text{ Dockage} = \frac{\text{Weight of dockage}}{\text{Weight of total paddy}} \times 100$$

Percentage Discolored kernels

25 gm paddy was measured using measuring scale. The discolored paddy were separated and then computed as following:

$$\% \text{ discolored grains} = \frac{\text{Weight of discolored grains}}{\text{Weight of total paddy}} \times 100$$

Percentage Damaged Kernels

A known weight of paddy was measured, while the damaged paddy is removed and measured then computed as below

$$\% \text{ damaged paddy} = \frac{\text{Weight of damaged grains}}{\text{Weight of total paddy}} \times 100$$

Grain Dimensions

Using a caliper, twenty (20) paddy samples were selected at random from each replicate and the dimension measured to obtain the average length and width of the paddy grains. To obtain the paddy shape, the following equation was used:

$$\text{Length to width ratio (L/W)} = \frac{\text{Average paddy length, mm}}{\text{Average paddy width, mm}}$$

Percentage immature and chalky grains:

Immature Grains: (Chalky and immature kernels are combined and treated as one component). A 25 gm grain sample was measured, selected and segregated and the immature grains in sample were weighed. The percentage immature grains in the sample were calculated using the formula:

$$\% \text{ immature grains} = \frac{\text{Weight of immature grains}}{\text{Weight of total paddy}} \times 100$$

RESULTS AND DISCUSSION

The main qualities, farmers preferred for paddy were brown hull in colour, long and slender in shape. Grain quality cannot be defined specifically for a particular grain. Several factors such as uniformity and soundness of the kernels, test weight, amount of foreign material in grain , breakage susceptibility are used to characterize grain quality for a particular end use of a grain type[6].

There was no significant difference between the moisture content of three varieties of paddy collected (Table -1, Figure - 1). Several researchers [7, 8] and [9] determined some physical properties of rice grains for some specific varieties, levels of processing and moisture content.

Grains with high moisture content are too soft to withstand hulling pressure without undue breakage and may be pulverized. Grain is too dry becomes greater breakage and proper moisture content to obtain the highest head rice yield [6].

Dockage in paddy is relatively high in uma variety as compared to other varieties, making it unfit for international export except further cleaning will be done. There was no significant difference in other varieties. The level of damaged kernels and discolored kernels were relatively high in uma variety. Damaged kernels are kernels or pieces of kernels that are sprouted or internally damaged as a result of heat, moisture, whether or microbes while discoloured kernels are kernels or piece of kernels that have changed the colour as a result of deteriorative changes [10].

CONCLUSION

The quality parameters of the three varieties of paddy (Ponnmani, Uma and White Ponni) were studied for dockage %, discoloured grain %, broken grain %, moisture content % and grain dimension. For Ponnmani, the dockage % is 0.2, discoloured grain % is 1.8, broken grain % is 0.53%, moisture content % is 8 and grain dimension is 2.28. For Uma, the dockage % is 0.4, discoloured grain % is 1.4, broken grain % is 1.06, moisture content % is 13.3 and grain dimension is 2.93. For White Ponni, dockage % is 0.33, discoloured grain % is 1.26, broken grain % is 0.33, moisture content % is 10 and grain dimension is 4.6. When parameters are considered different variety is superior in different parameters. Each variety has its own peculiarity and characteristics which need to

be worked on so that it can meet international standards.

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Table 1
Compare the quality parameters percentage in three varieties of paddy

Quality parameter	Ponnmani	Uma	White Ponni
Dockage %	0.2 ± 0.45	0.4 ±0.25	0.33± 0.52
Discoloured Grain %	1.8 ± 0.20	1.4±0.56	1.26±0.11
Broken Grain %	0.53 ± 0.07	1.06 ± 0.04	0.33±0.82
Moisture content %	8.0 ± 0.75	13.3 ± 0.23	13.3±0.38
Grain Dimension %	2.28 ± 0.52	2.93 ±0.76	4.6 ± 2.63

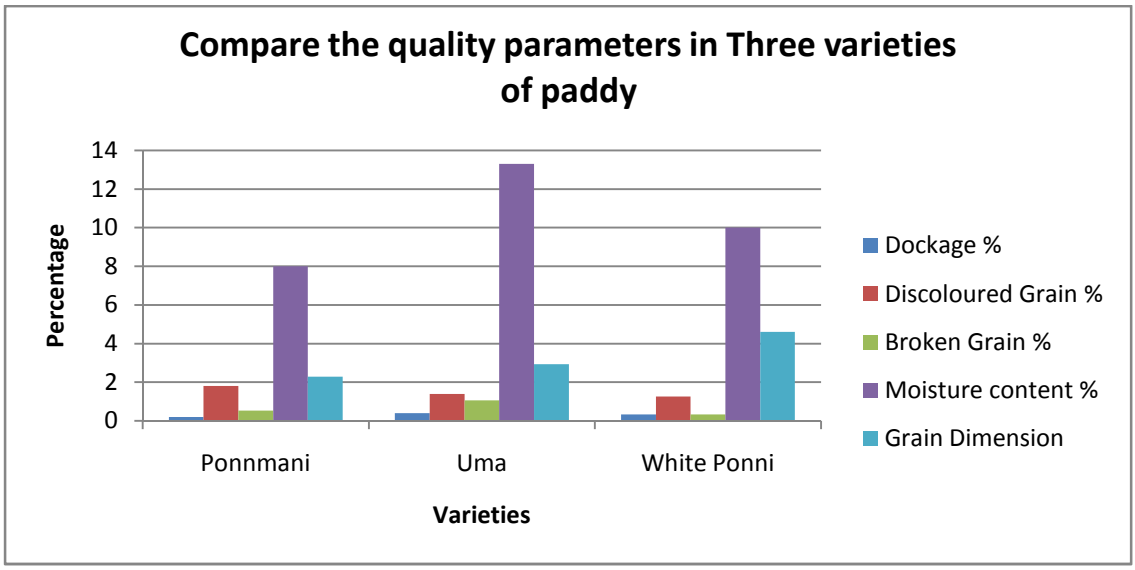

Figure 1
Graph showing the quality parmeters in three varieties of paddy

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