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## Evaluation of Nutritional Value's for Different Rice Varieties Cultivated in Ghoti Region

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### Abstract

Rice (*oryza sativa*) is one of most widely consumer food for larger part of human population. As a rice of different type having different nutritional values so, the main objective of study is to identify which rice variety has good nutritional value. Carbohydrates and protein content evaluated by IS 7219:1973 and USFDA Title 21, FDA April 2012 method. Some physical parameter also determined like moisture content, dimension etc. Results indicate that polished Kolpi rice (Carb-81.96% and Protein-7.85%) have good nutritional value than unpolished Kolpi rice (Carb-81.51% and Protein-7.79%). Whereas, polished Indrayani rice shows good protein (Carb-81.93% and Protein-7.85%) than unpolished Indrayani rice (Carb-82.39% and Protein-7.73%). On basis of carbohydrate we can conclude that unpolished Indrayani rice (82.39%) have good energy source than other varieties under study.

**Keywords:** Protein, Carbohydrates, Vitamins, Minerals, Dimension, Moisture content.

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### Introduction

Rice (*Oryza sativa*- Asian rice; Family-Gramineae) is most widely consumed staple food for large part of world human populations in Asia. As a cereal grain, it is the most widely

consumed staple food for a large part of the world's human population, especially in Asia and Africa. It is the predominant dietary energy source for 17 countries in Asia and the

Pacific, 9 countries in North and South America and 8 countries in Africa. Rice provides 20% of the world's dietary energy supply. Rice mainly consist carbohydrates (Approx. 90%), proteins, fibres, minute fat, minerals and vitamins. It is reported that 100g of rice gives 1480-1528 kJ energy (Anonymous, 2020).

In India various varieties of rice cultivated and Ghoti region one of the famous for rice cultivation. Mainly in Ghoti region three varieties of rice is cultivated, they are Kolpi, Indrayani, and Rice 1008. Basically Rice 1008 variety is native to Ghoti and Kolpi rice is native to Tamilnadu whereas Indrayani is native to Mulshi-Pune, Maharashtra (Varma D., *et al* 2019).

The nutritional values of rice differed from variety to variety even post milling and processing also affect the nutritional value. Unpolished rice (brown rice) contains comparately more amount of fibers, minerals and vitamins than polished rice (white rice). The complete milling and polishing that converts brown rice into white rice destroys 67% of the vitamin B3, 80% of the vitamin B1, 90% of the vitamin B6, half of the manganese, half of the phosphorus, 60% of the iron, and all of the dietary fibre and essential fatty acids (Cheickna D., and Hui Z., 2014; Roca M., 2020).

There is an always question in mind of common man which rice variety is better in view of nutritional value. In present study we tried to solve the question by evaluating some nutritional parameter for two varieties of rice- Indrayani and Kolpi. Both varieties under taken in poilished and unpolished form to get exact idea about their nutritional parameter.

## **Material and Method**

### **Procurement of Sample**

The rice sample are collected from the Ghoti Rice mill, two varieties of rice is collected viz Indrayani (Commercial name- Oryza indrayani) and Kolpi (Commercial name- Oryza kolpi) in October 2019. Both varieties were collected in polish form and unpolished form. So for study four samples collected as; polished Indrayani, un- polished Indrayani, polished Kolpi and un- polished Kolpi.

### **Preparation of Sample**

For determination of protein and carbohydrates, rice grains were crushed and pass from sieve No. 40 then store in polythene bag separately for further study. For determination of rest of the parameters all four samples kept in closed air tight stainless steel container.

### **Moisture Content Percentage**

Moisture content is the weight of water contained in grains expressed in percentage. Moisture content is measured using oven

method. The oven is set up at 130°C then all four samples weighed and placed inside the oven (WHO, 2002). Then the final weight of the sample is measured after 16 hours. Finally difference in weight calculated and reported in percentage.

### Grain Dimensions

Using a caliper, twenty (20) grain samples were selected at random from each replicate and the dimension measured to obtain the average length and width of the grains (Suganthi A., and Nacchair F.; 2015).

### Percentage Immature and Chalky Grains

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 (Suganthi A., and Nacchair F.; 2015).

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

### Determination of Protein

Protein in all sample determined by IS 7219:1973 method (BIS, 2019).

Total protein, by the Kjeldahl method, is defined as the amount of nitrogen experimentally found and multiplied by an appropriate conversion factor. The sample is oxidized in the presence of sulphuric acid and nitrogenous compounds are converted into ammonium sulphate. Mercury is added to the

digestion mixture as a catalyst and alkali sulphate as a boiling-point elevator. Ammonia is liberated by adding an excess of alkali and is quantitatively distilled into a measured volume of standard hydrochloric or sulphuric acid. The acid not neutralized by ammonia is back-titrated with standard alkali.

### Determination of Carbohydrates

Carbohydrates in all sample determined by USFDA Title 21, FDA April 2012 method.

Total carbohydrate content shall be calculated by subtraction of the sum of the crude protein, total fat, moisture, and ash from the total weight of the food (USFDA, 2020).

### Result and Discussion

There was no significant difference between the moisture content of polished varieties of Indrayani and Kolpi rice which undertaken for study. Whereas un-polished varieties of Indrayani and Kolpi rice shows comparatively significant moisture than both polished varieties. Moisture content indicates that both polish varieties remain free from microbial contamination during storage than unpolished variety or in other word we can predict unpolished rice easily absorb moisture durring storage and easily get detoriate than polished rice.

Results of moisture content, grain dimensions and percentage immature and chalky grains tabulated in Table 1.

**Table 1: Physical Parameters of Different Rice Varieties**

Physical Parameters	Indrayani		Kolpi	
	Polished	Un- Polished	Polished	Un- Polished
Moisture content*	09.03	11.63	10.17	13.12
Grain dimensions	6.05mm length 1.92mm width	6.07mm length 1.95mm width	5.00mm length 1.80mm width	5.05mm length 1.55mm width
% immature*	00.50	01.25	00.75%	01.65

\*values in %w/w

As per the result polished indrayani rice consist of large amount of protein (7.85%) as compare to total amount of unpolished indrayni rice (7.73%). Unpolished Indrayni rice consist of large amount of carbohydrate (82.39%) as compared to polished indrayani rice. Polished kolpi rice consist of large amount of protein (7.85%) as compare to the amount of polished kolpi rice (7.79%). Whereas, unpolished kolpi rice consist of large amount of carbohydrate (81.96%) as compare to amount of polished kolpi rice which is 81.51%. There is a significant difference in carbohydrate value of unpolished Indrayani rice than unpolished Kolpi (Fig.2). Results were tabulated in Table 2 for protein and carbohydrate content.

### Conclusion

Finally we conclude that, nutritional values like carbohydrates and protein does not show much

difference or very slightly differ in polished (white rice) and un-polished (brown) rice. Results indicate that polished Kolpi rice have good nutritional value than unpolished Kolpi rice other hand unpolished Indrayani rice have more carbohydrates than unpolished Kolpi. On basis of carbohydrate we can further conclude that unpolished Indrayani rice have good energy source than other varieties under study. No doubts further nutritional parameters suggested for polished Kolpi and unpolished Indrayani varieties like % mineral content, Vitamin content and % fiber content.

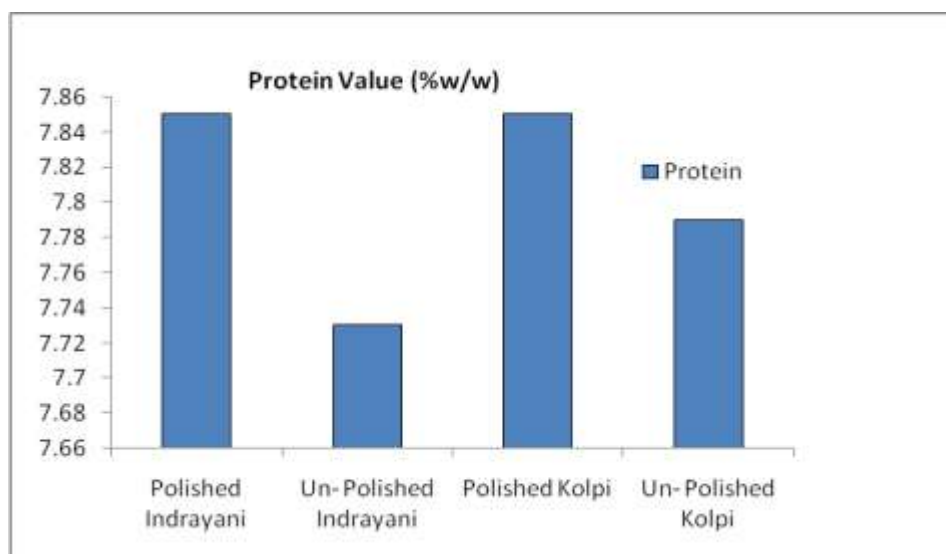
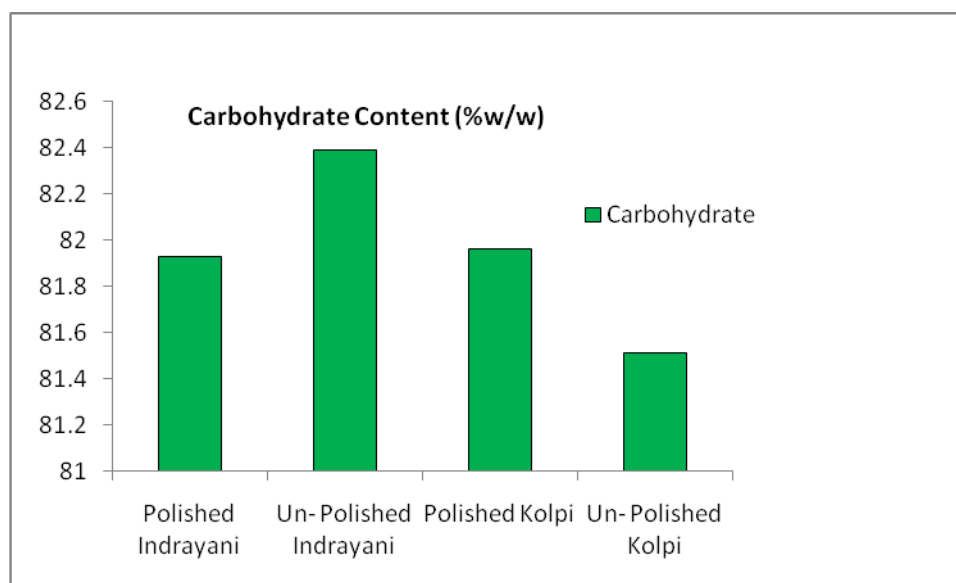
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**Table 2: Nutritional Parameter of Different Rice Varieties**

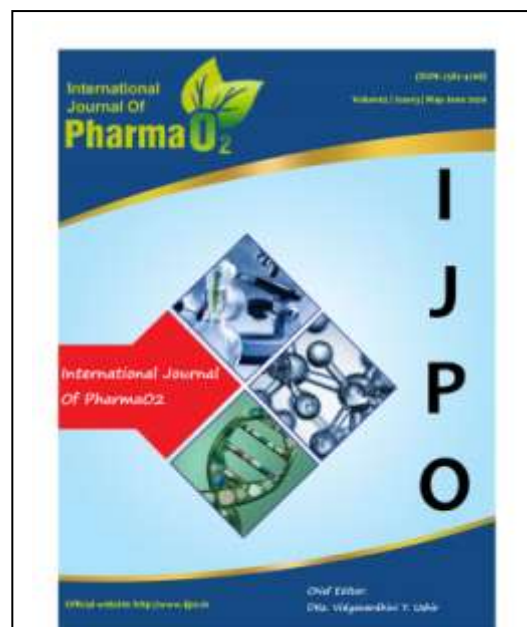
Nutritional Parameters*	Indrayani		Kolpi	
	Polished	Un- Polished	Polished	Un- Polished
Protein	07.85	07.73	07.85	07.79
Carbohydrate	81.93	82.39	81.96	81.51

\*values in % w/w

**Fig. 1: Comparative Protein Value for all Varieties of Rice****Fig. 2: Comparative Carbohydrate Value for all Varieties of Rice**

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