

# Comparative Studies of Nutritional Values of Rough Rice (*Oryza sativa*) and Jangli Rice (*Echinochloa colona*)

Rashmi Sharma<sup>1\*</sup>, Garima Kumari Chaumal<sup>1</sup> and Ashok Gupta<sup>1</sup>

Please check all authors' affiliation

<sup>1</sup>Department of Zoology, Samrat Prithviraj Chauhan Government College, Maharshi Dayanand Saraswati University, Ajmer, India.

Short Research Article

## ABSTRACT

Food is necessary for growth and health. Carbohydrate, protein and fat are three main types of macronutrients. Vitamins and minerals are two main micronutrients. All macro and micronutrients should be taken in adequate and balanced amount. Any one taken in large amount or low nutrition can cause disease or malnutrition. Overeating and high calorie diet cause high risk of cardiovascular disease, diabetes, dementia, cancer, liver disease, lower energy balance, stone in kidney and gall bladder and also respiratory diseases. Comparative account of Nutritional values of *Oryza sativa* and *Echinochloa colona* are discussed in the present paper. *Oryza sativa* is staple food used in East India, North India and South India. We in India (specially Rajasthan) *Triticum aestivum*, *Pennisetum glaucum*, *Sorghum bicolor*, *Cicer arietinum* are taken as food. During fast *Echinochloa colona*, *Fagopyrum tataricum*, *Amaranthus*, *Eleocharis dulcis* are taken. Comparative studies of nutritional values of *Oryza sativa* and *Echinochloa colona* are done in the present paper. Indian Himalayan saints observe fast and eat selected food during fast. These saints are disease free and live long life. Nowadays world is suffering from diabetes, cardiovascular diseases, cancer, dementia and Coronavirus, vegetarian diet, increase in immunity can be solution to some extent to these microbial infection problems.

Keywords: *Echinochloa colona*; *Oryza sativa*; food value.

## 1. INTRODUCTION

*Oryza sativa* belongs to family *Poaceae* and *Echinochloa* also belongs to family *Poaceae*. Common name of first is Rice and second one is jangal rice.

*Oryza sativa* is carbohydrate rich diet and *Echinochloa colona* have both essential and non-essential amino acids in sufficient amount. In addition also have iron, zinc, fiber and minerals sodium, potassium, magnesium, copper, manganese.

According to Vijay S. Borkar, Kolandaivelu, Kumaran, Mayar Chordiya (2016), Echinocloa colona used to cure various disorders such as wound healing, diabetes, antiseptic, antiulcer. S. Sumitra and Paru, Sharma Nidhi (2018) studied Echinocloa colona is antioxidant and antimicrobial.

Nutritional values of *Oryza sativa* and *Echinochloa colona* are discussed in the present paper. *Echinacea* is used to prevent cold & respiratory tract infection. (Merry-Jennifer M. D. Tieraona Low Dog MD 2013). *Echinacea* action is preventive against cold, (L.A. Mitscher 2007). *Echinochloa colona* is taken during fast in India and *Oryza sativa* is rice taken daily with food.

## 2. METHODS

100 grams of *Oryza sativa* and 100 grams of *Echinochloa colona* were taken, dried and powdered. Data were analyzed with the help of TEM and Chromatography manager software.

## 3. OBSERVATIONS AND RESULTS

**Table 1. Nutritional values of *Oryza sativa* and *Echinochloa colona* were following**

S.No.	Nutritional value	<i>Oryza sativa</i> (mg/kg)	<i>Echinochloa colona</i> (mg/Kg)
1.	Protein (gNx5.95)	7.2	10.7
2.	Fat (g)	2.1g	5.9g
3.	Fiber	8-10.3	12.3
4.	Ash	3-5	8.7
5.	Fiber crude		12.3
6.	Carbohydrate	65-74	51
7.	Neutral detergent fiber	3-4	
8.	Sucrose		1.0
9.	D Glucose		0.4
10.	D Fructose		0.4
11.	Thiamine	0.27-0.6	
12.	Riboflavin	.05-0.1	
13.	Niacin	3-5.7	
14.	Tochopherol	0.9-2	
15.	Calcium (mg)	11-80	0.05
16.	Phosphorus	0.17-0.39	0.41
17.	Phytin	0.19-0.38	
18.	Iron	1.3-6	108mg/kg
19.	Zinc	1.7-6	50
20.	Glycine		2.7g
21.	Alanine		10.4g
22.	Serine		4.8g
23.	Threonine*	4.6	3.4g
24.	Valine*	7.1	5.9g
25.	Leucine*	6.8-8.9	10.8g
26.	Isoleucine*	3-4.5	4.8g
27.	Proline		8.3g
28.	Tyrosine	6.1	4.4g
29.	Tryptophan*	2.0	
30.	Phenylalanine*	10.7	6.8
31.	Cystine		.8g
32.	Methionine*	4.6	1.7g
33.	Asparagine		
34.	Aspartic acid		5.1g
35.	Glutamine		
36.	Glutamic acid		25.4g
37.	Arginine*		41g
38.	Lysine*	3.2-4.6	2.2g

39.	Histidine*	1.6-2.7	2.2g
40.	Aminoacidscore		
41.	Fattyacid		14/100gsaturated
42.	Monounsaturated		16
43.	Polyunsaturated		18.
44.	Minerals(Sulphur)		0.1
45.	Magnisium		.23
46.	Sodium		.01
47.	Potasium		0.3
48.	Magnese		28mg/kg
49.	Copper		4mg/kg
50.	Alluminium		88mg

\*Essentialaminoacid

#### 4.DISCUSSION

Although *Oryzasativa* is eaten more in comparison to *Echinochloa colona*, later is more nutritious. Protein and fat content were more in *E. colona*, Fiber content were also more in *Echinochloa colona*, Ash and crude fiber were less in *O. sativa*. Value of carbohydrate were more in *O. sativa*. Vitamin B were negligible in *E. colona*. Minerals, nutrients and Amino acids were abundant in *E. colona*. *E. Colona* contains (Values are in mg/Kg) 12.3 fiber, 51 carbohydrate, sucrose 1.0, glucose 0.4, fructose 0.4. Phosphorus content is higher in *E. colona*. 41, while it is lower in *Oryzasativa* 0.17. Iron is 1.3 in *Oryzasativa* and 108 in *E. colona*. Calcium is 11 in *Oryzasativa*, and .05 in *E. colona*. Zinc is 1.7 in *O. sativa* and 50 in *E. colona*. Glycine 2.7, Alanine 10.4, and Serine 4.8 are present in *E. colona* and absent in *O. sativa*. Threonine (4.6 and 3.4) Valine (7.1 and 5.9) and leucine (6.8 and 10.8) and isoleucine (3 and 4.8) present in both *O. sativa* and *E. colona*. Proline (8.3) is present in *E. colona* only. Tyrosine is also present in both (6.1 and 4.4) respectively. Tryptophan (2.0) is present in *O. sativa*. Phenylalanine is present in both (10.7 and 6.8 respectively). Cystine (0.8) is present in *E. colona* only. Methionine is present in both (4.6 and 1.7). Methionine is starting amino acid degenerated coded by only AUG on triplet codon. Aspartic acid (5.1) and Glutamic acid (25.4) are present in *E. colona* only. Arginine (41.0) is present only in *E. colona*. Lysine present in both 3.2 *O. sativa* and 2.2 in *E. colona* Histidine is also present in both 1.6 in *O. sativa* and 2.2 in *E. colona*. Fatty acid (14/100g) are present in *E. colona* only. Monounsaturated Fatty acid (16), Polyunsaturated fatty acid (18) respectively. Sulfur .1, magnesium .23, sodium .01, potassium 0.3, Magnese 28, copper 4mg/kg. *Echinochloa colona* contains all Essential and nonessential amino acids and minerals good fatty acids so it is super food and better than *O. sativa*. It also increases our body immunity, body can fight in better way microbial diseases. In one paper it is discussed that *E. colona* can prevent cold and respiratory tract infections. So it is also useful in present day Covid-19 or CORONA infection which has become pandemic. (Merry-Jennifer M.D. Tiera on a Low Dog MD 2013). *Echinacea* action is preventive against cold, (L.A. Mitscher 2007).

#### 5.CONCLUSION

Although *Oryzasativa* is nutritious *Echinochloa colona* is more valuable having more Essential and nonessential amino acids and Minerals. All essential amino acids represent Threonine 3.4, Valine 5.9, leucine 10.8, Isoleucine 4.8, Methionine 1.7, Phenylalanine 6.8g. Arginine 41g, Lysine 2.29, Histidine 2.2g. Protein content is more in *Echinochloa colona*.

Amount of fat and fibers are also more in *Echinochloa colona*. Monounsaturated fatty acid 16, Polyunsaturated 18, Minerals 0.1, Magnesium 0.23, Sodium 0.01, Potassium 0.3, Magnese 28, Copper 4mg, Phosphorus 41, Iron 108, Zinc 50. Aspartic acid, Glutamic acid, and Arginine are also present in *Echinochloa colona* and absent in *Oryzasativa*. Glycine, Alanine and serine are present in *Echinochloa colona* and absent in *Oryzasativa*.

Minerals like sodium, Potassium, Magnesium and copper are present in *Echinochloa colona* and absent in *Oryzasativa*. *Echinochloa colona* is having more nutritional values. Indian Saints from Himalaya eat less, observe fast for most of the time and eat *Amaranthus*, *Echinochloa colona*, *Fagopyrum esculentum*, *Trapa*, vegetables and fruits. They do not suffer from diseases and live long life.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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