

# Comparative Studies of Nutritional values of Rough Rice (*Oryza sativa*) And Jangli Rice(*Echinochola colona*)

---

1. Dr Rashmi Sharma and 2 Garima Kumari Chaumal and 1 Ashok Gupta

1. Associate Professor 2. Research Scholar

Department of Zoology

SPCGCA MDSU

Ajmer

## Abstract

*Food is necessary for growth and health. Carbohydrate protein and fat are three main type of macronutrients. Vitamins and minerals are two main micronutrients. All macro and micro nutrients 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 *Echinochola colona* are discussed in the present paper. *Oryza sativa* is staple food used in East India, North India and South India. West India (specially Rajasthan) *Triticum aestivum*, *Pennisetum glaucum*, *Sorghum bicolor*, *Hordeum vulgare*, *Cicer arietinum* are taken as food. During fast *Echinochola colona*, *Fagopyrum tataricum*, *Amaranthus*, *Eleocharis dulcis* are taken. Comparative studies of nutritional values of *Oryza sativa* and *Echinochola 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. Now a days world is suffering from diabetes, cardiovascular diseases, cancer, dementia and Corona virus , vegetarian

diet , increases immunity can be solution to some extant to these microbial infection problems.

Key words : *Echinocloa colona*, *Oryza sativa* , Food value.

## **Introduction**

*Oryza sativa* belongs to family *Poaceae* and *Echinochloa* also belongs to family *Poaceae* .

Common name of first is Rice and second one is jangali rice .

*Oryza sativa* is carbohydrate rich diet and *Echinochloa colona* have both essential and non essential aminoacids 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 Parul , 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.

## **Methods**

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

## Observations and Results

Nutritional values of *Oryza sativa* and *Echinochola colona* were following :

S. No.	Nutritional Value	<i>Oryza sativa</i> ( mg /kg)	<i>Echinochola colona</i> (mg / Kg)
1.	Protein (g Nx5.95)	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.	Amino acid score		
41.	Fatty acid		14/100g saturated
42.	Monounsaturated		16
43.	Polyunsaturated		18.
44.	Minerals (Sulphur)		0.1
45.	Magnesium		.23
46.	Sodium		.01
47.	Potassium		0.3
48.	Magnese		28mg/kg
49.	Copper		4mg/kg
50.	Alluminium		88mg

\*Essential amino acid.

## Discussion

Although *Oryza sativa* 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 Aminoacids 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 *Oryza sativa* 0.17. Iron is 1.3 in *Oryza sativa* and 108 in *E. colona*. Calcium is 11 in *Oryza sativa*, and .05 in *E. colona*. Zn 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 one 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 /100 g ) 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 4 mg/kg. *Echinocola colona* contains all Essential and non essential amino acids and minerals good fatty acids so it is superfood 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. Tieraona Low Dog MD 2013). *Echinacea action* is preventive against cold , (L.A. Mitscher 2007).

## Conclusion

Although *Oryza sativa* is nutritious *Echinochola colona* is more valuable having more Essential and non essential amino acids and Minerals. All essential amino acids are present 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 *Echinochola colona*.

Amount of fat and fibers are also more in *Echinochola 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 *Oryza sativa*. Glycine , Alanine and serine are present in *Echinochloa colona* and absent in *Oryza sativa*.

Minerals like sodium, Potassium , Magnesium and copper are present in *Echinochloa colona*

and absent in *Oryza sativa*. *Echinochloa colona* is having more nutritional values. Indian Saints from Himalayas 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.

## References

1. Abdelmuti OMS , 1991. Biochemical and nutritional evaluation of famine foods of Sudan . Doctoral dissertation in Biochemistry and Nutrition . Faculty of Agriculture. Khartoum, Sudan : University of Khartoum .
2. Acevedo –Rodriguez P; Strong MT , 2012. Catalogue of the seed plants of west Indies. Smithsonian Contributions to Botany , 98: 1192 pp . Washington DC, USA : Smithsonian Institution.
3. Ahmed NU ; Moody K, 1980. Effect of method of seeding and weed control on weed growth and yield of two rice crops grown in sequence . Tropical Pest Management , 26(2): 303-308.
4. . Ahmed NU ; Moody K, 1982. Weeds in cropping systems as affected by landscape position and weeding regime. IV. Land with a high ponding potential ( *Oryza sativa* , rice, Philippines ) Philipp-Agric, 65 (2): 169-175. (AGRICOLA, USDA ).
5. Alit Diratmadja IGP , 1988. The presence of green leafhopper *Nephotettix nigropictus* Stsl to Some weeds and rice variety TN 1. Buletin Penelitian 5:8-17.
6. Balal MS ; Siddiq IA ; Maurer EA , eds ., 1988 Highlights of recent rice research in Egypt 1981-1985 . Ministry of Agriculture and Land Reclamation , Cairo , Egypt . 116pp
7. Merry –Jennifer Markham M.D. Tieraona Low Dog M.D, 2013. Consultative homeostasis & Thrombosis 3 rd Ed.
8. L.A. Mitscher . 2007 . Comparative medical chemistry.
9. Randall RP, 2012. A Global Compendium of Weeds ., Perth , Australia : Department of Agriculture and Food Western Australia . 1124pp.
10. Queensland Department of Primary Industries and Fisheries , 2011. Special edition

of Environmental weeds of Australia for Biosecurity Queensland., Australia : The University of Queensland and Department of Primary Industries and Fisheries.

11. Shirasuna RT , 2014 . Echinochloa in the list of species of the flora of Brazil . Rio de Janeiro, Brazil : Jardim Botânico do Rio de Janeiro .
12. S. Sumitra and Parul , Sharma Nidhi ( 2018) Studied Echinochloa colona is antioxidant and antimicrobial.
13. Flora of China Editorial Committee , 2014. Flora of China . St. Louis, Missouri and Cambridge , Massachusetts, USA : Missouri Botanical Garden and Harvard University Herbaria.
14. Michael PW , 2009. Echinochloa colona versus “ Echinochloa colonum “ (Poaceae ) Taxon , 58 (4) 1366-1368.
15. Vijay S. Borkar , Kolandaivelu , Kumaran , Mayar Chordiya ( 2016), Echinochloa colona used to cure various disorders such as wound healing , antidiabetic , antiseptic, antiulcer.
16. Wu TL, 2001. Check List of Hong Kong Plants . In : Agriculture , Fisheries and Conservation Department Bulletin , 1 384.