

Contents

1	Rice	1
1.1	Rice Background	1
1.2	Taxonomy and Genetics	2
1.3	Rice Domestication	4
1.4	Conditions of Growth	5
1.5	Rice Cropping Seasons	5
1.6	Rice Grain Structure	6
1.7	Types of Rice	6
1.7.1	Long Grain Rice	8
1.7.2	Medium Grain Rice	8
1.7.3	Short Grain Rice	8
1.8	Other Rice Types	9
1.8.1	Sweet Brown Rice	9
1.8.2	Wehani Rice	10
1.8.3	Brown Basmati Rice	10
1.8.4	Himalayan Red Rice	11
1.8.5	Colusari Red Rice	12
1.8.6	Purple Thai Rice	12
1.8.7	Chinese Black Rice	13
1.8.8	Sweet or Waxy Rice	13
1.8.9	Aromatic Rice	13
1.8.10	US Arborio Rice	14
1.9	Rice Forms	15
1.9.1	Rough Rice	15
1.9.2	Brown Rice	16
1.9.3	White Rice	17
1.9.4	Paraboiled Rice	17
1.9.5	Precooking Rice	18
	References	19

2	Black Rice	21
2.1	Introduction	21
2.1.1	Chinese Black Rice	24
2.1.2	The Forbidden Rice	25
2.1.3	The Emperor's Rice	26
2.2	Origin and Domestication of Black Rice	26
2.2.1	Domestication Process	27
2.2.2	Black Conversion Process	28
2.2.3	Spread Process	29
2.3	Genetics of Black Rice	29
2.4	Health Benefits	31
2.5	Pecularity of Black Rice	36
2.5.1	Rich in Iron	37
2.5.2	Rich in Protein	37
2.5.3	A Naturally Gluten Free Grain	37
2.5.4	Black Rice Versus Blueberries	38
2.5.5	Power Up	38
2.5.6	Delicious	38
2.5.7	Affordable	38
2.5.8	Easy to Prepare	38
2.5.9	Taste and Smell	39
2.6	Popularity of Black Rice	39
2.7	Black Rice Cons, Side Effects and Negatives	40
2.8	Ways to Call Black Rice in Different Languages	40
	References	42
3	History	49
3.1	History of Black Rice	49
3.2	Discovery of Forbidden Rice	52
	References	53
4	Nutrition Profiles of Black Rice	55
4.1	Nutrition of Different Rice Types	56
4.2	Nutritional Facts of Black Rice	57
4.3	Factors Affecting Rice Nutrition	57
4.4	Chemicals Present in Black Rice	59
4.4.1	Anthocyanin Profile of Black Rice	61
4.4.2	Cyanidin-3-Glucoside (C3G)	67
4.5	Rice Preparation for Consumption and Its Effects on Nutrition	69
4.5.1	Washing or Rinsing Rice Before Cooking	69
4.5.2	Cooking	69
4.5.3	Wet Milling	69
4.5.4	Parboiling	70
4.5.5	Fermentation	71

4.6	Rice Cooking Methods and Anthocyanin Content.	71
4.7	Nutrient Content and Degree of Milling	74
4.8	Aromatic Chemistry of Black Rice.	75
	References	79
5	Black, Brown, and Red Rices	85
5.1	Major Differences Among Different Rice.	85
5.1.1	White, Long-Grain Rice	86
5.1.2	Colored Rice	86
5.2	Brown Rice.	91
5.3	Red Rice.	93
5.4	Black Rice	94
5.5	Difference in Black and Brown Rice.	96
5.5.1	Difference in Calories	96
5.5.2	Differences in the Carbohydrates, Protein and Fat.	96
5.5.3	Difference at the Minerals	97
5.5.4	Difference in Antioxidant Power	97
	References	98
6	Economic Importance.	101
	References	103
7	Black Rice Applications	105
7.1	Natural Food Coloring Dye.	106
7.2	Future Uses of Black Rice.	107
	References	113
8	Black Rice Cultivation	115
8.1	Black Rice Varieties.	116
8.1.1	Typical Characteristics of Black Rice	118
8.2	Method of Cultivation.	119
8.2.1	Broadcasting Method	119
8.2.2	Drilling Method	122
8.2.3	Transplantation Method.	122
8.2.4	Japanese Method	122
8.2.5	Upland Cultivation	123
8.2.6	Lowland Cultivation	123
8.2.7	Transplanting Methods in Detail.	123
8.3	Diseases	127
8.3.1	Blast.	127
8.3.2	Bacterial Leaf Blight.	128
8.3.3	Sheath Blight.	130
8.3.4	Brown Spot.	130
8.3.5	Stem Rot.	131
8.3.6	False Smut	132
8.3.7	Bacterial Leaf Streak	132

8.3.8	Tungro Virus	133
8.3.9	Khaira Disease	134
8.4	Insect Pests	134
8.4.1	Stem Borer	135
8.4.2	Gall Midge	136
8.4.3	Rice Hispa	136
8.4.4	Leaf Roller	137
8.4.5	Armyworm	137
8.4.6	Mole Cricket	138
8.4.7	Green Leaf Hopper	138
8.4.8	Plant Hopper	139
8.4.9	Swarming Caterpillar	139
8.4.10	Gundhi Bug	140
8.4.11	Rats	140
8.5	Harvesting and Threshing	147
8.6	Post-harvest Loss	148
8.7	Yield	149
	References	149
9	Health Benefits of Black Rice	151
9.1	Enhances Health and Increases Longevity	153
9.2	Protects Heart Health	154
9.3	Reduce Atherosclerosis	157
9.4	Control Hypertension	159
9.5	Reduces Stroke Risk Levels in Women	159
9.6	Improves Digestive Health	159
9.7	Anti-inflammatory Action	160
9.8	Reduces Allergy	161
9.9	Detoxifies the Body	162
9.10	Lipid Profile Improvement	164
9.11	Reduces Risk of Diabetes	164
	9.11.1 Vision and Eye Health	165
	9.11.2 Cardiovascular Health	165
	9.11.3 Glucose Metabolism	165
	9.11.4 Weight Loss	165
9.12	Improves Eye Vision	166
9.13	Help in Satiation and Weight Management	166
9.14	Reduces Cancer Growth	167
9.15	Increases Life Span	171
9.16	Protects from Osteoporosis	173
9.17	Enhances Hair Growth	174
9.18	Reduces Risk of Asthma	174
9.19	Antioxidative Effects	174
9.20	Acts as GABA Rice	176
9.21	Works as Nature’s Great Super Foods	176

- 9.22 Black Rice is a Panacea 177
- 9.23 Other Possible Health Benefits 177
- References 178
- 10 Black Rice Recipes 185**
 - 10.1 Rice Cooking Methodology 185
 - 10.1.1 Absorption Method 186
 - 10.1.2 Steaming Method 186
 - 10.1.3 Boiling Method 186
 - 10.2 Basic Directions for Absorption 186
 - 10.2.1 Rinsing 186
 - 10.2.2 Measuring 186
 - 10.2.3 Simmering 186
 - 10.3 Cooking Black Rice 187
 - 10.4 Rice Cooking Tips and Its Serving 187
 - 10.5 Black Rice Pudding 189
 - References 190
- Index 191**



<http://www.springer.com/978-3-319-30152-5>

Black Rice

Research, History and Development

Ujjawal, K.

2016, XX, 192 p. 65 illus., 59 illus. in color., Hardcover

ISBN: 978-3-319-30152-5