

**A Comparative Study Between Enzyme -
Assisted Extraction Methods Of Rice
Bran Oil And Their Effect On Oil Yield As
Well As Oil And Protein Qualities**

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Abstract

Stabilization of rice bran was accomplished by two methods namely, microwave heating and direct hexane extraction. Microwave heating proved to be very efficient. To increase the extracted quantity of the oil from the stabilized rice bran, it was subjected to enzymatic hydrolysis, which breaks the cell walls and facilitates oil release. Three enzymes were used: Protease (P), Macerozyme (M), and α -Amylase. All enzymes resulted in improved oil yield reaching 32, 32, and 31% extracted oils for enzymes P, M, and A, respectively, compared to 24-25% extracted oil by no enzyme treated rice bran under same conditions (control). Treatment with enzyme A resulted in oils with very high free fatty acid contents between 16-19%. Thus the use of A enzyme was excluded. Mixtures of P&M at different enzyme ratios (1:1, 1:2, 2:1 v/w) and different enzyme concentrations (1, 1.5, 2 w/w) of rice bran, different bran: water ratios (1:5, 1:7, 1:10 w/v), and different time of hydrolysis (1, 3, 6 h) were investigated. Experiments with mixed enzymes at the different conditions proved that highest %increase in oil extractability ca. 38%, over the control were achieved under the following conditions of hydrolysis: 2% enzyme concentration (1:1 and 2:1 **M:P** ratio) at 1:10 bran :water ratio and 3 and 6h hydrolysis, and 1.5% enzyme concentration (1:1 **M:P** ratio) at 1:10 bran: water ratio for 6h hydrolysis. This was followed by ca. 37% increase in oil extractability for treatments 1.5% enzyme concentration (1:1 **M:P** ratio), and 1:10 bran: water ratio for 1 and 3 h, and 2% enzyme concentration (2:1 **M:P** ratio), 1: 10 bran: water ratio, and hydrolysis for 1 hour. The effect of the mode of oil extraction after the enzymatic treatment on the oil and meal quality was investigated. Results did not show much difference but hydraulic pressing and miscella extraction gave slightly better oil and meal qualities.

Key words: Rice bran, enzymatic hydrolysis, stabilization, oil extraction, oil quality, meal quality.

Contents

I. INTRODUCTION.....	6
I.1. Rice.....	6
I.2. Rice Bran.....	7
1.2.1. Rice Bran Oil.....	9
1.2.2. Unsaponifiable matter(USM).....	11
1.2.3.Rice bran wax	14
1.2.4. Rice Bran Protein.....	15
1.2.4.1.Amino acids composition of rice bran protein	16
1.2.4.2. Solubility of rice bran protein.....	17
1.2.4.3. Digestibility of rice bran protein.....	18
1.2.4.4. Functional properties of rice bran protein...	20
1.2.5. Rice bran Dietary Fiber.....	21
1.2.6. Health Benefits of Rice Bran.....	23
1.2.7. Food and non food Uses of rice bran.....	28
1.3. Rancidity of Rice Bran.....	30
1.4. Stabilization of Rice Bran.....	32
1.5. Extraction of Rice Bran Oil.....	40

1.5.1. Conventional oil extraction processes.....	40
1.5.1.1. Mechanical pressing	40
1.5.1.2. Solvent extraction.....	40
1.5.2. Supercritical Carbon Dioxide Extraction...	44
1.5.3. Aqueous extraction of rice bran oil.....	45
1.5.4. Aqueous Enzymatic Pretreatment of Rice Bran	48
2.EXPERIMENTAL.....	55
2.1.Materials.....	55
2.2. Experimental.....	56
2.2.1. Stabilization of rice bran.....	56
2.2.1.1. Stabilization by solvent.....	56
2.2.1.2. Stabilization by Microwave Heating.....	56
2.2.2. Single Enzyme treatment.....	57
2.2.3. Oil and meal separation.....	58
2.2.4. Sequence of addition of enzyme mixture	58
2.2.5. Determination of optimum conditions for oil yield using enzyme mixtures.....	59
2.2.6.Oil extraction methods following enzymatic pretreatment of rice bran.....	61

2.2.6.1.Enzymatic pretreatment of stabilized rice bran (SRB) followed by solvent extraction of oil.....	61
2.2.6.2.Enzymatic pretreatment of stabilized rice bran followed by Hydraulic pressing.....	62
2.2.6.3.Enzymatic pretreatment of stabilized rice bran in the presence of hexane (miscella)...	62
2.2.7.Oil and Meal Analyses.....	64
2.2.7.1. Oil Analyses.....	64
2.2.7.1.1.Chemical characteristics of oils.....	65
2.2.7.1.2. Identification and determination of fatty acids	65
2.2.7.1.3. Determination of oxidative stability of oil..	66
2.2.7.2. Meal analyses.....	67
2.2.7.2.1. Determination of moisture content.....	67
2.2.7.2.2. Determination of protein content.....	67
2.2.7.2.3. Determination of fiber content.....	68
2.2.6.2.4. Determination of ash content.....	69
2.2.7.2.5. Nitrogen solubility (NS).....	69
2.2.7.2.6. In vitro protein digestibility (IVPD).....	70
2.2.7.2. 7. Determination of Functional properties...	71
2.2.7.2.7.1. Oil holding capacity (OHC).....	71
2.2.7.2.7.2. Water holding capacity (WHC %).....	71
2.2.7.2.7.3. Emulsifying capacity.....	72

2.2.7.2.7.4. Foam Capacity (FC).....	72
2.2.7.2.7.5. Foam Stability (FS).....	72
2.2.7.2.8.Determination of Phytate.....	73
2.2.7.2.9.Determination of antioxidant activity using the β -carotene method.....	76
2.3. Statistical Analysis	78
3. RESULTS AND DISCUSSION.....	79
3.1. Proximate composition of rice bran.....	80
3.2. Stabilization of rice bran.....	80
3.2.1. Effect of stabilization by hexane.....	82
3.2.2. Effect of stabilization by microwave heating...	83
3.3. Enzymatic pretreatment of stabilized rice bran prior to oil extraction.....	86
3.3.1. Effect of pretreatment of microwave stabilized rice bran with single enzymes on yield and FFA of the extracted oil.....	87
3.3.2. Effect of pretreatment of microwave stabilized rice bran with enzyme mixtures on yield and FFA of the oil.....	99
3.3.3. Determination of Optimum conditions for oil yield using enzyme mixtures.....	102
3.3.4. Regression analysis of results.....	119

3.4. Oil extraction from stabilized, enzyme treated rice bran.....	122
3.5.Defatted meal resulting after the oil extraction from stabilized, enzyme treated rice bran.....	128
Tables.....	137
Figures.....	165
References.....	178

List of Figures

Fig	Title	Page
1.	Relative proportion of major rice caryopsis components	7
2.	Chemical structures of vitamin E components (A - tocopherols, B - tocotrienols)	13
3.	Storage stability of microwave stabilized rice bran oil as indicated by the FFA content of oil	165
4.	Effect of enzymatic treatment of microwave stabilized rice bran on extracted oil at 1h	165
5.	Effect of enzymatic treatment of microwave stabilized rice bran on extracted oil at 3h	166
6.	Effect of enzymatic treatment of microwave stabilized rice bran on extracted oil at 6h	166
7.	Effect of addition of enzyme mixture (M&P) on % extracted oil and FFA%	167
8.	Effect of treatment of microwave stabilized rice bran with enzyme mixture macerozyme and protease (M&P) at different concentrations and ratios on extracted oil and at 1:5, B: W ratio	167
9.	Effect of treatment of microwave stabilized rice bran with enzyme mixture macerozyme and protease (M&P) at different concentrations and ratios on extracted oil at 1:7, B:W ratio	168
10.	Effect of treatment of microwave stabilized rice	168

	bran with enzyme mixture macerozyme and protease (M&P) at different concentrations and ratios on extracted oil at 1:10, B:W ratio	
11.	<p>Correlation between % increase in oil extractability and time of hydrolysis at different enzyme concentration and different bran: water ratios</p> <p>11a) = 1% EC (1:1, M:P) 11b) = 1.5% EC (1:1, M:P) 11c) = 2% EC (1:1, M:P)</p> <p>EC = Enzyme concentration</p>	169
12.	<p>Correlation between % increase in oil extractability and time of hydrolysis at different enzyme concentration and different bran: water ratios</p> <p>12a) = 1% EC (1:2, M:P) 12b) = 1.5% EC (1:2, M:P) 12c) = 2% EC (1:2, M:P)</p>	170
13.	<p>Correlation between % increase in oil extractability and time of hydrolysis at different enzyme concentration and different bran: water ratios</p> <p>13a) = 1% EC (2:1, M:P) 13b) = 1.5% EC (2:1, M:P) 13c) = 2% EC (2:1, M:P)</p>	171
14.	<p>Correlation between % increase in oil extractability and bran: water ratio at different mixed enzyme concentration and different time of hydrolysis</p> <p>14a) = 1% EC (1:1, M:P) 14b) = 1.5% EC (1:1, M:P) 14c) = 2% EC (1:1, M:P)</p>	172
15.	<p>Correlation between % increase in oil extractability and bran: water ratio at different mixed enzyme concentration and different time of hydrolysis</p> <p>15a) = 1% EC (1:2, M:P) 15b) = 1.5% EC (1:2, M:P) 15c) = 2% EC (1:2, M:P)</p>	173
16.	Correlation between % increase in oil	174

	<p>extractability and bran: water ratio at different mixed enzyme concentration and different time of hydrolysis</p> <p>16a) = 1% EC (2:1, M:P) 16b) = 1.5% EC (2:1, M:P) 16c) = 2% EC (2:1, M:P)</p>	
17.	<p>Correlation between % increase in oil extractability and enzyme concentration (with different M:P) and at different bran: water ratios and 1h hydrolysis</p> <p>17a) = 1:1, M:P ratio 17b) = 1:2, M:P ratio 17c) = 2:1, M:P ratio</p>	175
18.	<p>Correlation between % increase in oil extractability and enzyme concentration (with different M:P) and at different bran: water ratios and 3h hydrolysis</p> <p>18a) = 1:1, M:P ratio 18b) = 1:2, M:P ratio 18c) = 2:1, M:P ratio</p>	176
19.	<p>Correlation between % increase in oil extractability and enzyme concentration (with different M:P) and at different bran: water ratios and 6h hydrolysis</p> <p>19a) = 1:1, M:P ratio 19b) = 1:2, M:P ratio 19c) = 2:1, M:P ratio</p>	177
20.	<p>Oxidative stability of the oils extracted by different extraction methods from stabilized enzyme treated rice bran as indicated by TBARS values</p>	178

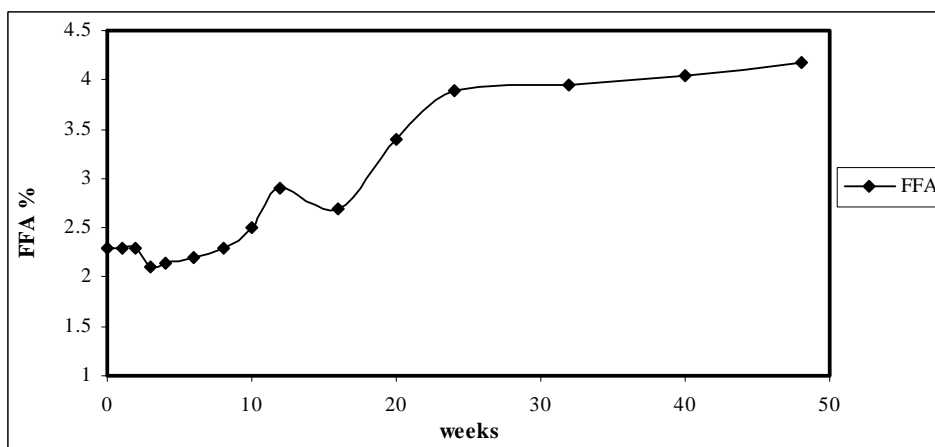


Figure 3:Storage stability of microwave stabilized rice bran oil as indicated by the FFA content of oil

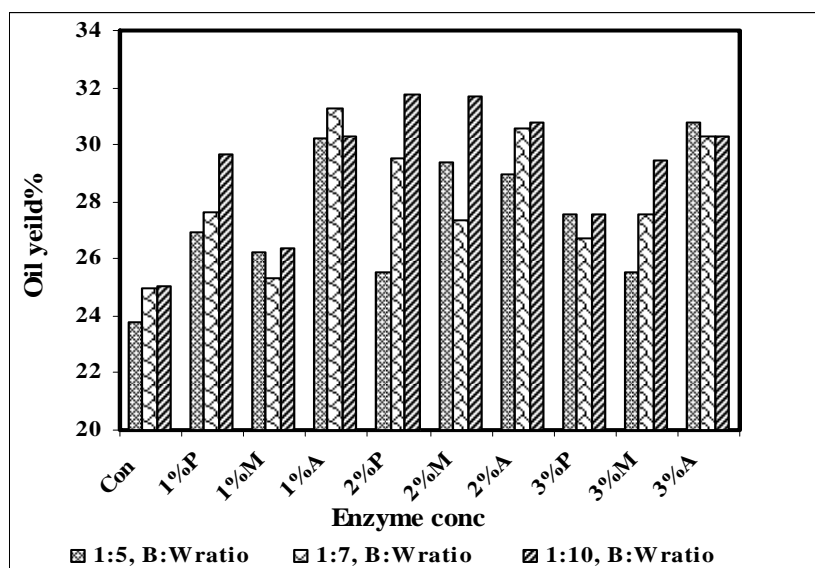


Figure 4: Effect of enzymatic treatment of microwave stabilized rice bran on extracted oil at 1h