

4<sup>th</sup> International Conference on the  
Chemical Societies of the South-East European Countries  
on

**Chemical Sciences in Changing Times:  
Visions, Challenges and Solutions**

**Book of Abstracts  
Vol. II**

**Symposium A**

*Advanced Materials: From Fundamentals to Applications*

**Symposium B**

*The Greening of Chemistry:*

*Pursuit of a Healthy Environment and Safe Food*

**Symposium C**

*Teaching and Understanding Chemistry:*

*New Concepts and Strategies for Changing Times*

**ICOSECS 4**

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**July, 18-21, 2004**

**Belgrade, Serbia and Montenegro**

## Characterization of Components Obtained during the Processing of Three Rough Rice Cultivars

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During processing of rough rice into white rice (polished rice) through a series of operations, hulls and bran are obtained. Rice is number one food crop in the world. However, from recently rice and its structural parts are utilized for production of value-added products. Oil rich with antioxidants, very good adsorbents for removing metal ions and gases, and edible films could be obtained. Further processing of rice by-products depends of their composition.

Therefore the present study is focused on the characterization of the rough rice, hulls, bran and white rice of three the most abundant rice cultivars in Macedonia, Monticelli; Prima Riska and P-76/6.

The solubilization potentials of the proteins fractions (albumins, globulins, prolamins and glutelins) of all components and gelatinization behavior of white rice were evaluated.

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The International Scientific Committee thanks

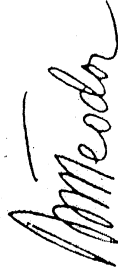
**M. Bocevska, D. Andreevska, Verica Ilieva, Nevenka Pavlovska**

for presenting the contribution

**CHARACTERIZATION OF COMPONENTS OBTAINED DURING PROCESSING OF THREE  
ROUGH RICE CULTIVARS**

**at ICOSECS 4**

President of the International  
Scientific Committee  
ICOSECS 4



Prof. Teodor Ast

# CHARACTERIZATION OF COMPONENTS OBTAINED DURING PROCESSING OF THREE ROUGH RICE CULTIVARS

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**MACEDONIA**

# INTRODUCTION

Rice is number one food crop in the world. During processing of rough rice into white rice (polished rice) through a series of operation, hulls (20%) and bran (10%) are obtained. From recently rice and its structural parts are utilized for production of value-added products: oil rich with antioxidants, very good adsorbents for removing metal ions and gaseous and edible films. Further processing of rice by-products depends of their structural characteristics.

# EXPERIMENTAL

Extraction of Albumins: rice flour (0,5g) was shaken 5 min with distilled water (15 min) at room temperature (21°C). The suspension was centrifuged at 3000 rpm for 15 min and the supernatant decanted. The extraction was repeated five times in the same manner. Globulins were extracted of flour residues on the same manner with 10% NaCl, Prolamins were isolated with 70% ethanol at 80°C and Glutelins with 0,2% NaOH at room temperature.

Protens were determined in the supernatants according to the method of Lowry.

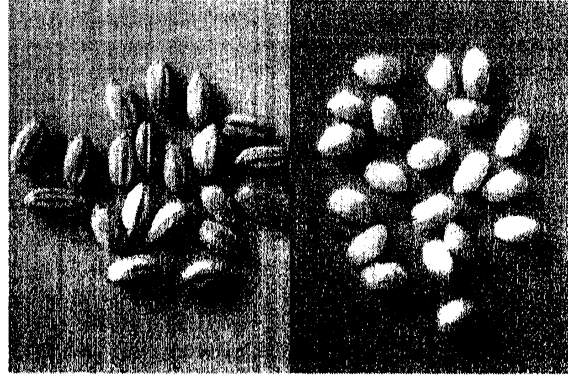
Gelatinization behaviour of rice grain was determined with soaking (23 h) in 1,7% KOH

Viscosity of rice flour was determined with Brabender Amilograf.

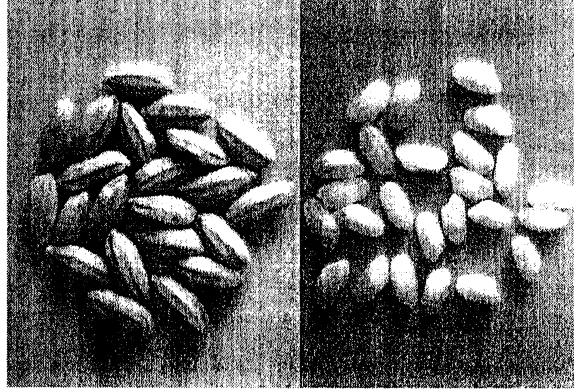
# OBJECTIVE

This study is focused on the soluble protein fractions of the rough rice, white rice, hulls and bran and gelatinization behaviour of white rice of three most abundant cultivars in Macedonia:

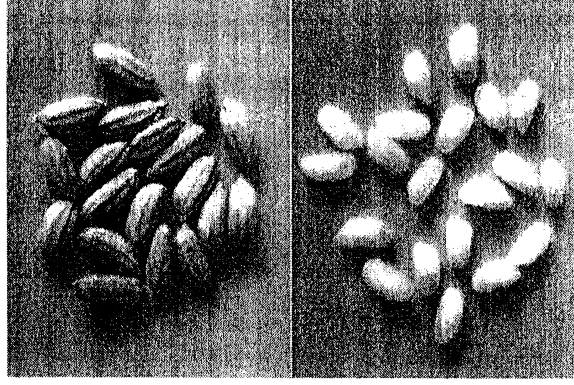
Monticheli



Prima riska

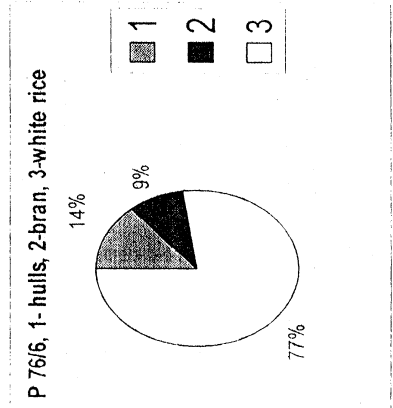
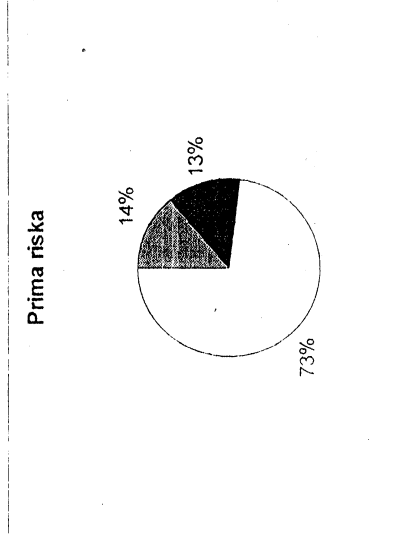
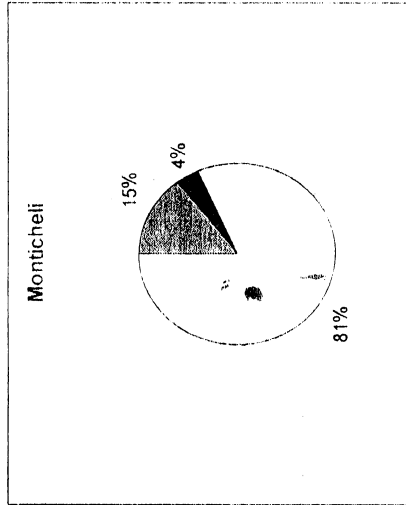


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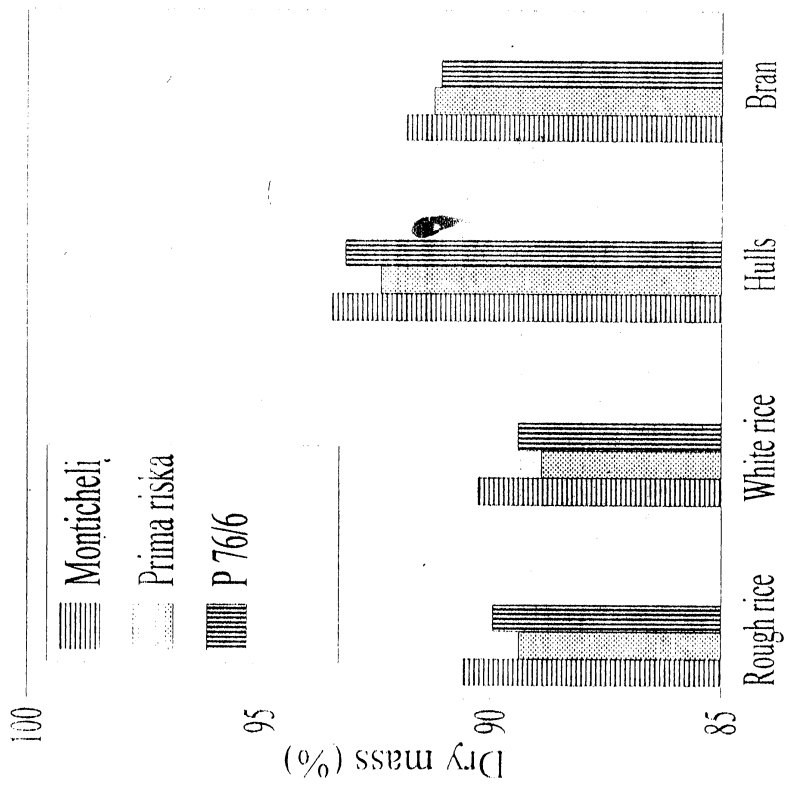


# RESULTS

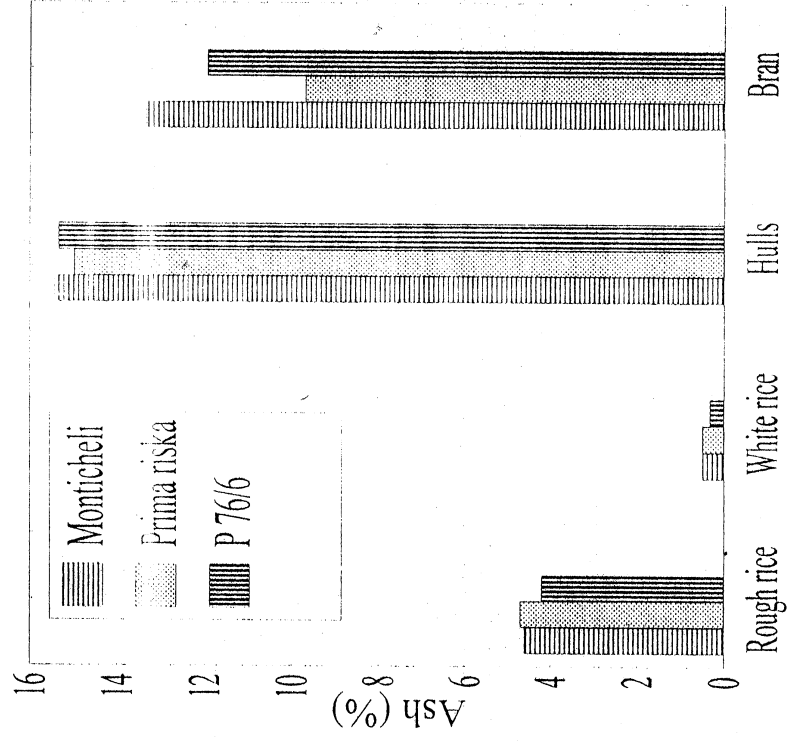
Characteristics	Monticheli	Prima riska	P 76/6
Mass of 100 grains (g):			
of rough rice	4,396	5,252	5,291
of white rice	2,839	3,696	3,754
Dimensions (mm)			
length	Rough 7,96 White 5,52	Rough 9,58 White 6,3	Rough 9,32 White 6,42
width	Rough 3,79 White 3,22	Rough 4,19 White 3,29	Rough 3,89 White 3,29
thickness	2,28	2,44	2,48



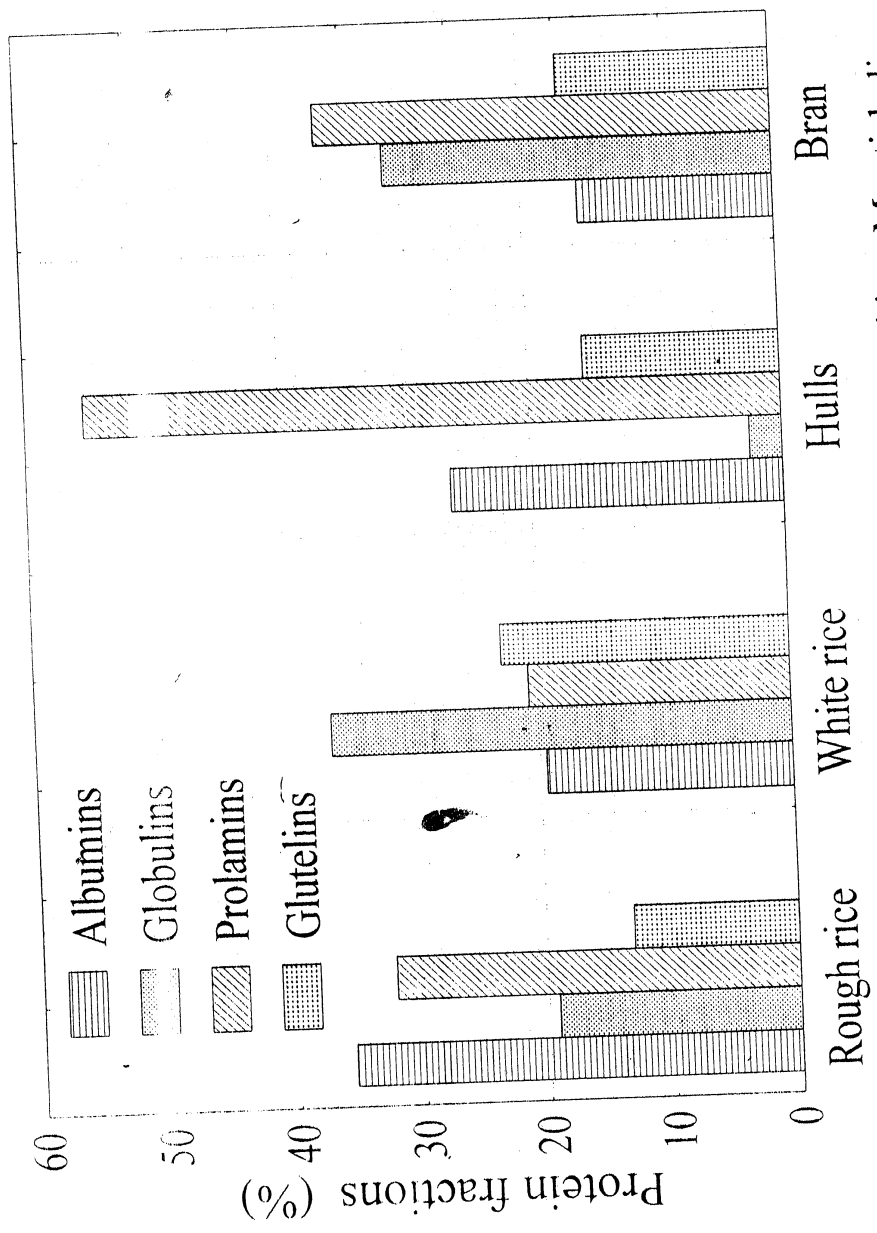




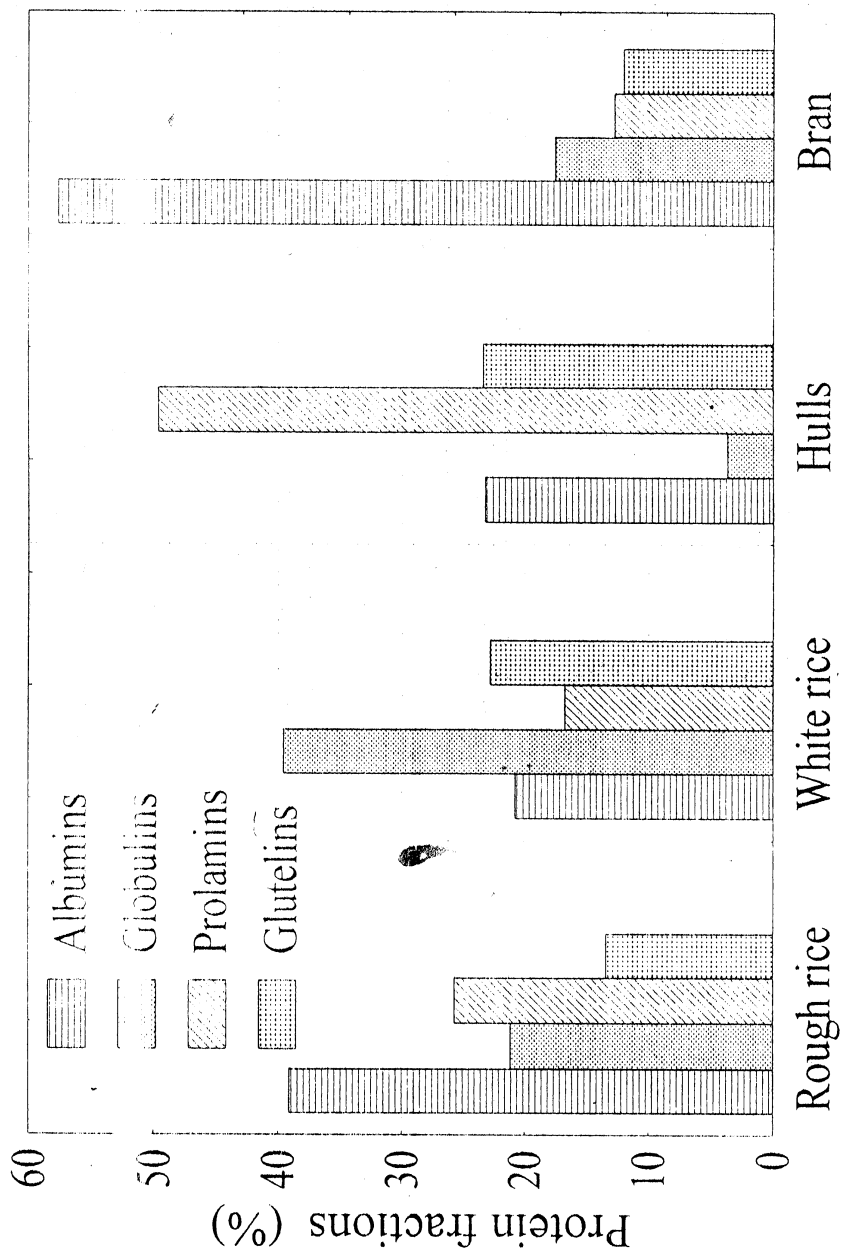
Content of dry mass in component part of processed rice



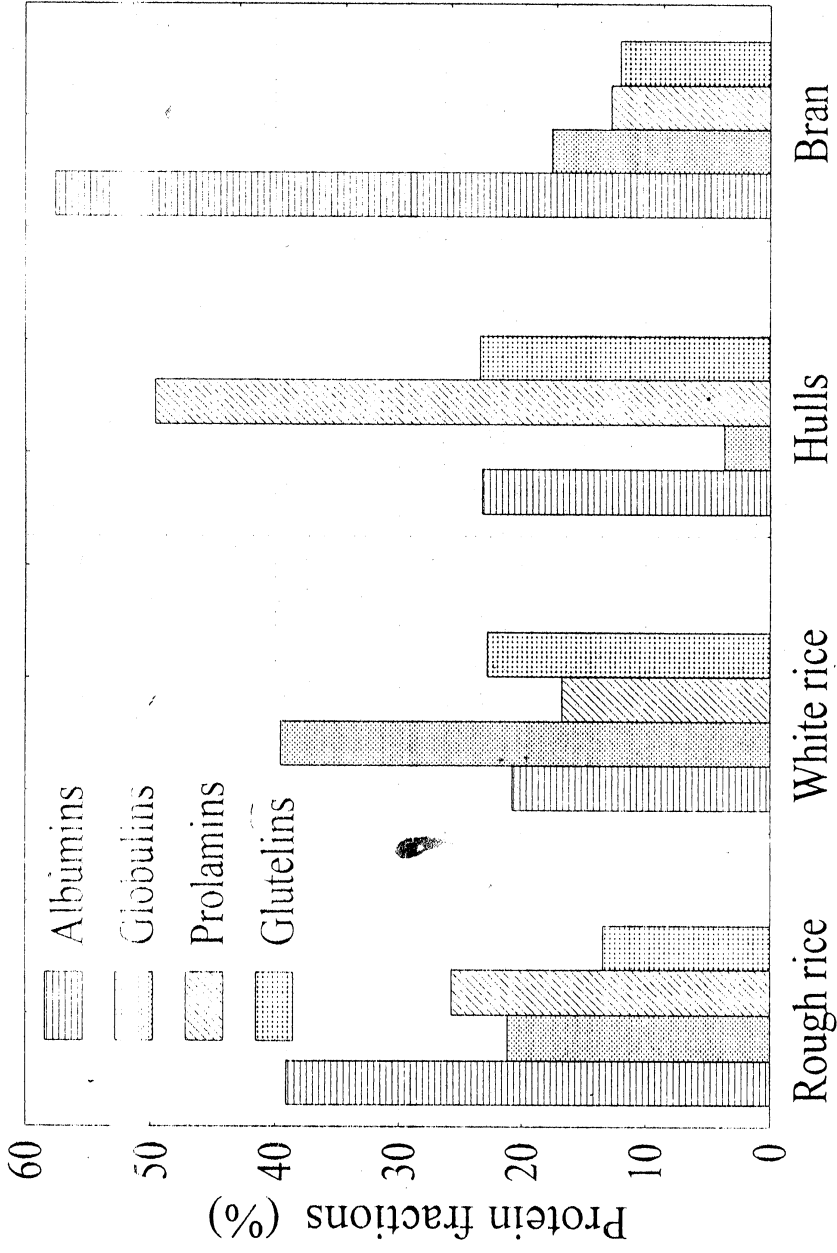
Content of ash in component part of processed rice



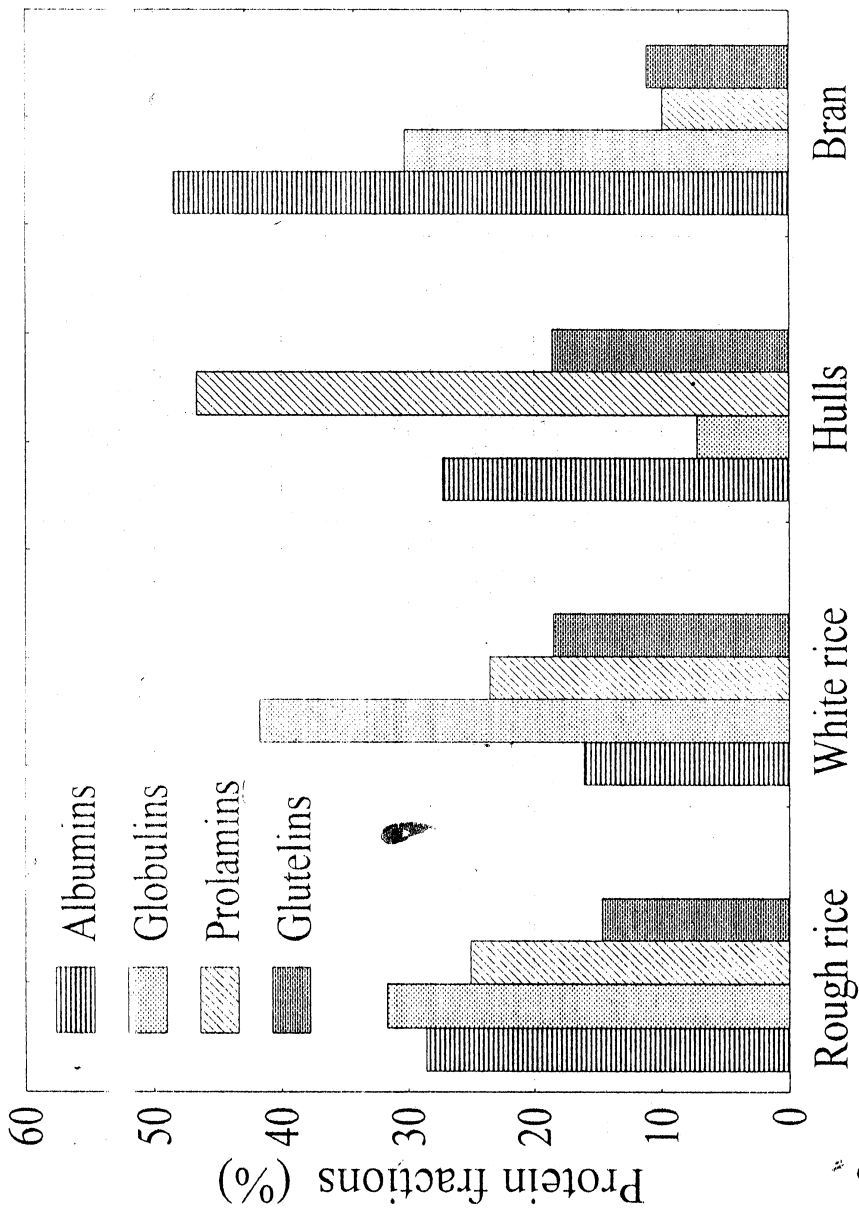
Protein fractions in total soluble proteins of cultivar Monticelli



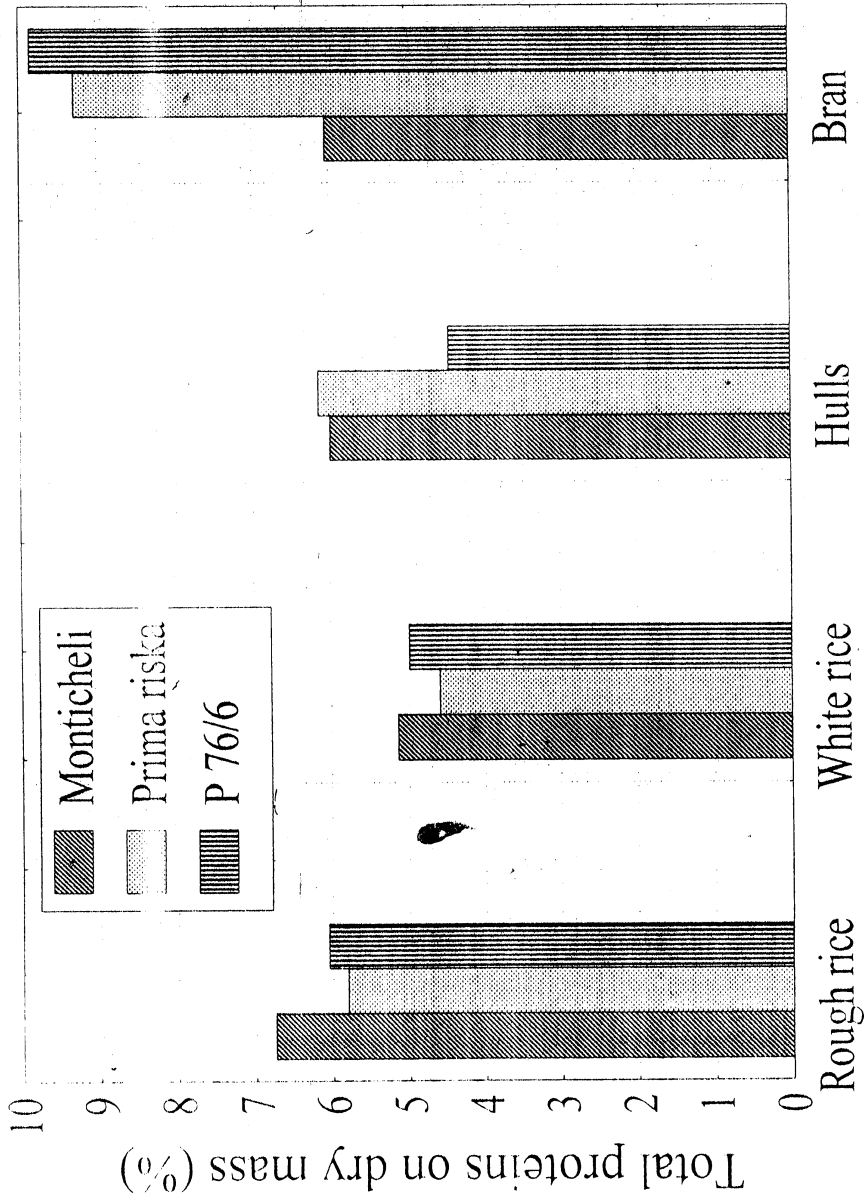
Protein fractions in total soluble proteins of cultivar Prima riska



Protein fractions in total soluble proteins of cultivar Prima riska



Protein fractions in total soluble proteins of cultivar P 76/6



Content of total soluble proteins in structural parts of three rice cultivars

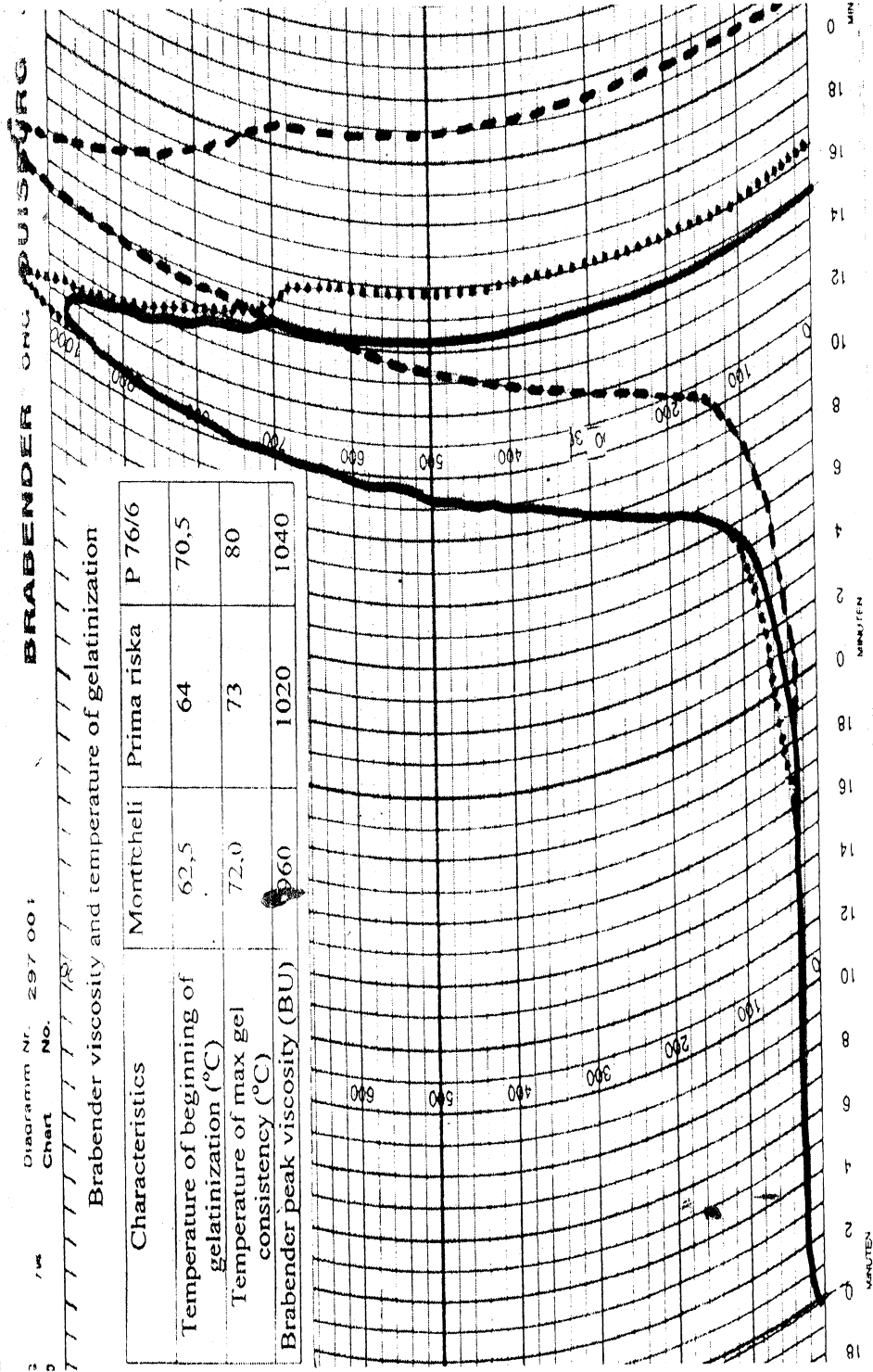
# Brabender viscosity of rice flour of the cultivars: Monticheli ; ... Prima riska and --- P 76/6

Diagram No. 297 001  
Chart No.

BRABENDER OHG BRUNNEN

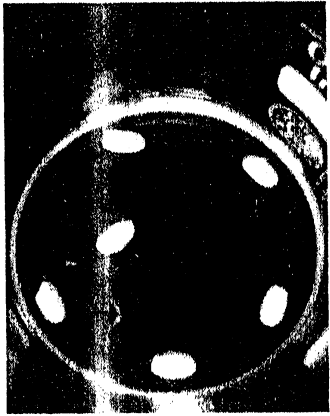
Brabender viscosity and temperature of gelatinization

Characteristics	Monticheli	Prima riska	P 76/6
Temperature of beginning of gelatinization (°C)	62,5	64	70,5
Temperature of max gel consistency (°C)	72,0	73	80
Brabender peak viscosity (BU)	960	1020	1040

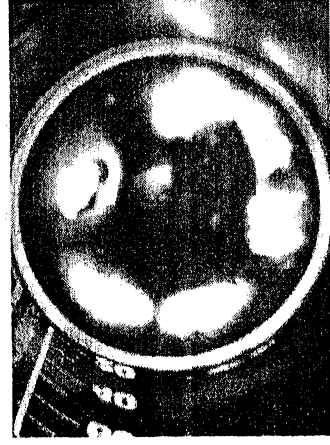
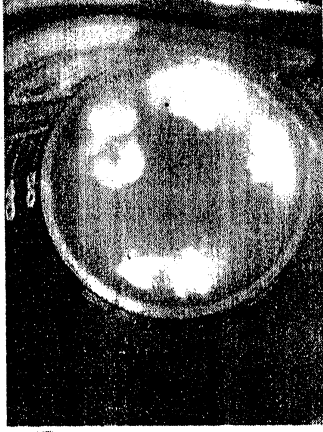
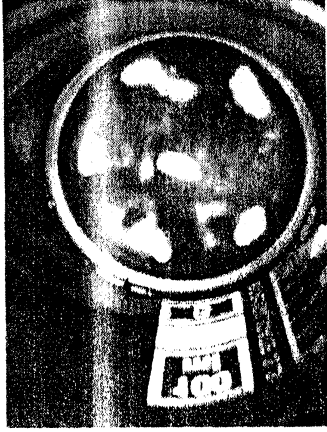


# GELATINIZATION BEHAVIEOUR

Monticheli



Prima riska



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