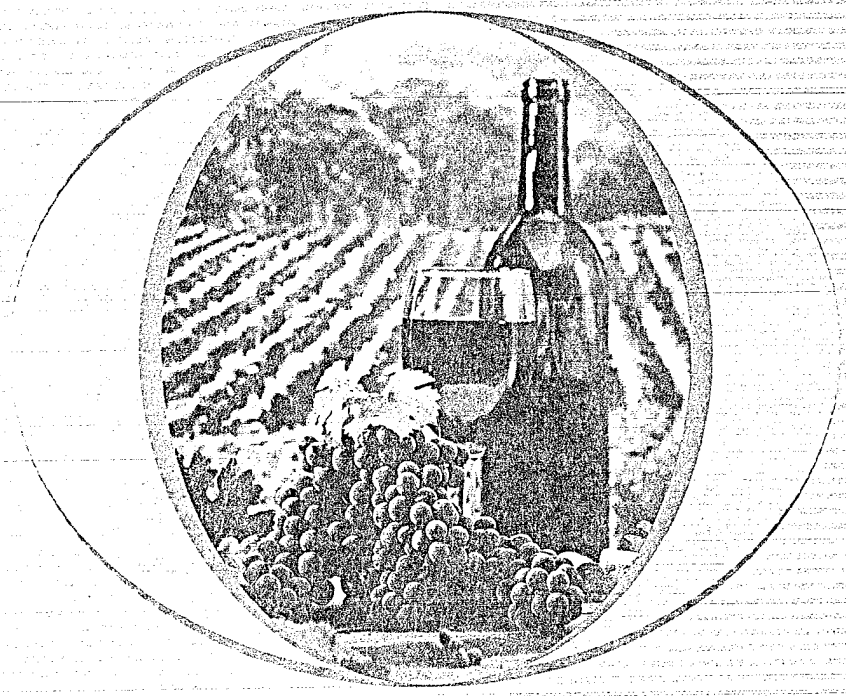
15 години

ВИСШЕ УЧИЛИЩЕ "ЗЕМЕДЕЛСКИ КОЛЕЖ"

КОНФЕРЕНЦИЯ С МЕЖДУНАРОДНО УЧАСТИЕ

"ДИВЕРСИФИКАЦИЯ НА СЕЛСКИТЕ РАЙОНИ В БЪЛГАРИЯ"



24 ОКТОМВРИ, 2007
ДОМ НА УЧЕНИТЕ, ПЛОВДИВ

СБОРНИК ДОКЛАДИ

15 ГОДИНИ
ВИСШЕ УЧИЛИЩЕ
"ЗЕМЕДЕЛСКИ КОЛЕЖ"

КОНФЕРЕНЦИЯ С МЕЖДУНАРОДНО УЧАСТИЕ

"Диверсификация на селските райони в България"

Под патронажа на:

г-н Нихат Кабил

Министър на земеделието и продоволствието

Доц. д-р инж. Симеон Василев

Председател на СУБ - Пловдив

Доц. д-р инж. Димитър К. Димитров

Ректор на ВУЗК

24 октомври, 2007
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THE CONTENTS OF PROTEINS WITH SOME ITALIAN RICE VARIETIES GROWN IN THE REGION OF KOCANI-MACEDONIA

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Abstract: In 2003 in the program of the selection, from Italy, there have been introduced the following varieties of rice: *andolla, castelmochi, cistella, dedalo, diana, italmochi, pegaso, prometeo, ringo* and *selenio.* These varieties with two standards: *biser-2* and *monticelli* are being grown in a two-year's time in a field experiment with a method of random block system in Kocani, Macedonia. Each one of the varieties of rice and the standards are being grown with three repetitions. The size of a repetition is $5m^2$. A standard agro technique has been applied. With these varieties in faze of full maturity, the contents of total nitrogen in milled samples of grains of paddy and white rice has been determined by Kjeldahl method. By multiplying of the contents of the total nitrogen with the coefficient 5,95 the contents of the crude proteins has been determined as well.

Compared with the results in 2002 (when the varieties were grown in Italy), with the Italian varieties grown in soil-climate conditions in Kocani in 2003 a significant reducement of the contents of total nitrogen and protein in the grain of paddy and white rice has been noticed. It tends on increasing in the next year 2004.

The biggest average contents of protein in Italian varieties grown in Macedonia (average 2003/2004) is found in the variety *dedalo* (paddy - 7,32%) and *pegaso* (white rice - 7,62%) and the smallest in *prometeo* (paddy - 6,16%) and *prometeo* and *castelmochi* (white rice - 6,37%). The standard one is : *biser-2* (paddy - 6,61%; white rice - 6,75%) and *monticelli*

(paddy - 6,96%; white rice - 7,08%).

Key words: rice, varieties, contents of total nitrogen and proteins, paddy, white rice

INTRODUCTION

The improvement of paddy and white rice yields, the quality of grain and the rentability in rice production is a steady process.

The rice has a better food value than many others food stuffs which contain a great amount of carbonhydrates. The contents of proteins in a grain is an extreme variety variability, and it varies from 7,0% in white to 8,0% in cargo rice (1). On the other hand, the balance of amino acids in proteins in rice is extremely good.The contents of lizin in proteins e.g. on average varies from 3,8 to 4,0%. The contents of proteins depends on the variety of rice, as well as it depends on the conditions in which the rice is grown (e.g. soil, climate etc.) and the agrotechnics which was been applied, especially nitrogen fertilization (2, 3, 4 and 5). The purpose of these researches was to determine the contents of row proteins in grains of ten new Italian varieties of rice grown in the conditions of the rice growing area in Kocani. The contents of proteins has been measured in grains grown in Italy, as well. The final results will befundamental for further researches in selection and rice production and marketing.

MATERIAL AND METHODS

During 2003 and 2004 in the area "Bosevica" in Kocani on the surface of Institute of agriculture-Skopje, Rice department - Kocani a field experiment has been made, using the method of random block system. There were 10 varieties of rice grown in the experiment: *andolla, castelmochi, cistella, dedalo, diana, italmachi, pegaso, prometeo, ringo and selenio* from Italy (Ente nazionale risi -Milano) compared with two standards: *biser-2 and monticelli.* Each of the grown varieties and standards were grown with three repetitions, and the size of one repetition is $5m^2$. During the growing of the rice varieties there has been used a standard agrotechnics. When these varieties were mature completely, the contents of total nitrogen in

milled grains of paddy and white rice has been measured using the method of Kjeldahl (6). It,s very important to know the contents of nitrogen, because it is usually used to determine the contents of the proteins. The quantity of proteins in grain of paddy and white rice which weights one gramme is determined by multiplying the content of total nitrogen by the coefficient for calculating of proteins in rice given by IRRI (International Rice Research Institute Manila Philippines) - 5,95. The results are shown in a table in per cent.

RESULTS

The results of the research are shown in tables 1,2,3 and 4, and figure 1 and 2. They show that the biggest contents of total nitrogen and proteins in the grain of paddy and white rice, comparing those of the varieties grown in 2002 in Italy, is found in the variety *andolla* (paddy: 1,36% and 8,09%; white: 1,44% and 8,57%), and the least in : *selenio* (paddy: 1,10% and 6,55%) and *prometeo* (white:1,03% and 6,13%).

There has been a significant decreasing in the contents of total nitrogen and proteins in the grain of paddy and white rice analysing the Italian varieties grown in the conditions in the area of Kocani. This contents tends to get bigger in the next year, 2004.

The biggest average contents of total nitrogen and proteins in a grain of Italian variety grown in Macedonia (average 2003/2004) is found in the variety *dedalo* (paddy: 1,23% and 7,32%) and the variety *pegaso* (white rice: 1,28% and 7,62%), and the least one in: *prometeo (paddy: 1,04% and 6,16%)* and *prometeo* and *castelmochi* (white: 1,07% and 6,37%).

The average contents of total nitrogen and proteins in the grains of standard varieties is: *biser-2* (paddy:1,11% and 6,61%; white rice:1,14% and 6,75%) and *monticelli* (paddy: 1,17% and 6,96%; white rice:1,19% and 7,08%).

Table 1 *(Grain total nitrogen content in paddy rice of different rice varieties -(%))*

Variety	Origin	Varieties grown in			
		Italy	R. Macedonia		
		Year			Average 2003/2004
		2002	2003	2004	
biser-2-standard	R.Macedonia	-	1,12	1,10	1,11
monticelli-standard	,,	-	1,22	1,12	1,17
andolla	Italy	1,36	1,13	1,22	1,18
castelmochi	,,	1,28	1,01	1,11	1,06
cistella	,,	1,26	1,13	1,16	1,15
dedalo	,,	1,25	1,20	1,26	1,23
diana	,,	1,15	1,06	1,08	1,07
italmachi	,,	1,29	1,07	1,08	1,08
pegaso	,,	1,19	1,08	1,30	1,19
prometeo	,,	1,13	1,02	1,05	1,04
ringo	,,	1,24	1,16	1,25	1,21
selenio	,,	1,10	1,12	1,11	1,12

Table 2 *(Grain total nitrogen content in white rice of different rice varieties (%))*

Variety	Origin	Varieties grown in			
		Italy	R. Macedonia		
		Year			Average 2003/2004
		2002	2003	2004	
biser-2-standard	R.Macedonia	-	1,14	1,13	1,14
monticelli-standard	,,	-	1,24	1,14	1,19
andolla	Italy	1,44	1,15	1,27	1,21
castelmochi	,,	1,31	1,00	1,14	1,07
cistella	,,	1,26	1,13	1,11	1,12
dedalo	,,	1,33	1,20	1,32	1,26
diana	,,	1,18	1,07	1,13	1,10
italmachi	,,	1,20	1,09	1,18	1,14
pegaso	,,	1,32	1,20	1,36	1,28
prometeo	,,	1,03	1,10	1,04	1,07
ringo	,,	1,25	1,23	1,18	1,21
selenio	,,	1,20	1,10	1,08	1,09

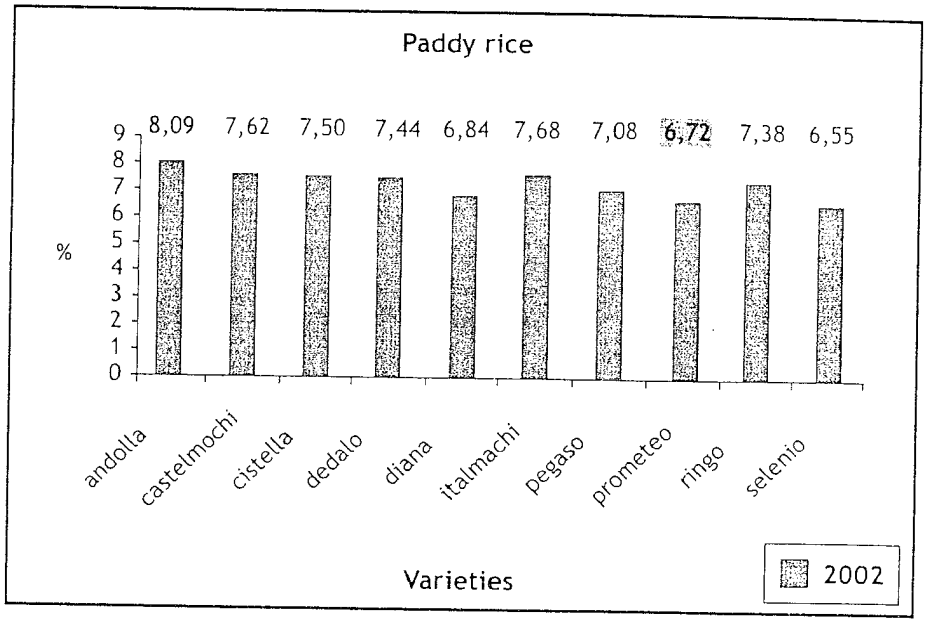
Table 3 *(Grain proteins content in paddy rice of different rice varieties (%))*

Variety	Origin	Varieties grown in			
		Italy	R. Macedonia		
		Year			Average 2003/2004
		2002	2003	2004	
biser-2-standard	R.Macedonia	-	6,66	6,55	6,61
monticelli-standard	,,	-	7,26	6,66	6,96
andolla	Italy	8,09	6,72	7,26	6,99
castelmochi	,,	7,62	6,01	6,60	6,31
cistella	,,	7,50	6,72	6,90	6,81
dedalo	,,	7,44	7,14	7,50	7,32
diana	,,	6,84	6,31	6,43	6,37
italmachi	,,	7,68	6,37	6,43	6,40
pegaso	,,	7,08	6,43	7,74	7,09
prometeo	,,	6,72	6,07	6,25	6,16
ringo	,,	7,38	6,90	7,44	7,17
selenio	,,	6,55	6,66	6,60	6,63

Table 4 *(Grain proteins content in white rice of different rice varieties (%))*

Variety	Origin	Varieties grown in			
		Italy	R. Macedonia		
		Year			Average 2003/2004
		2002	2003	2004	
biser-2-standard	R.Macedonia	-	6,78	6,72	6,75
monticelli-standard	,,	-	7,38	6,78	7,08
andolla	Italy	8,57	6,84	7,56	7,20
castelmochi	,,	7,79	5,95	6,78	6,37
cistella	,,	7,50	6,72	6,60	6,66
dedalo	,,	7,91	7,14	7,85	7,50
diana	,,	7,02	6,37	6,72	6,55
italmachi	,,	7,14	6,49	7,02	6,76
pegaso	,,	7,85	7,14	8,09	7,62
prometeo	,,	6,13	6,55	6,19	6,37
ringo	,,	7,44	7,31	7,02	7,17
selenio	,,	7,14	6,55	6,43	6,49

Figure 1 *(Content of crude proteins in grain of diferent rice varieties grown in Italy)*



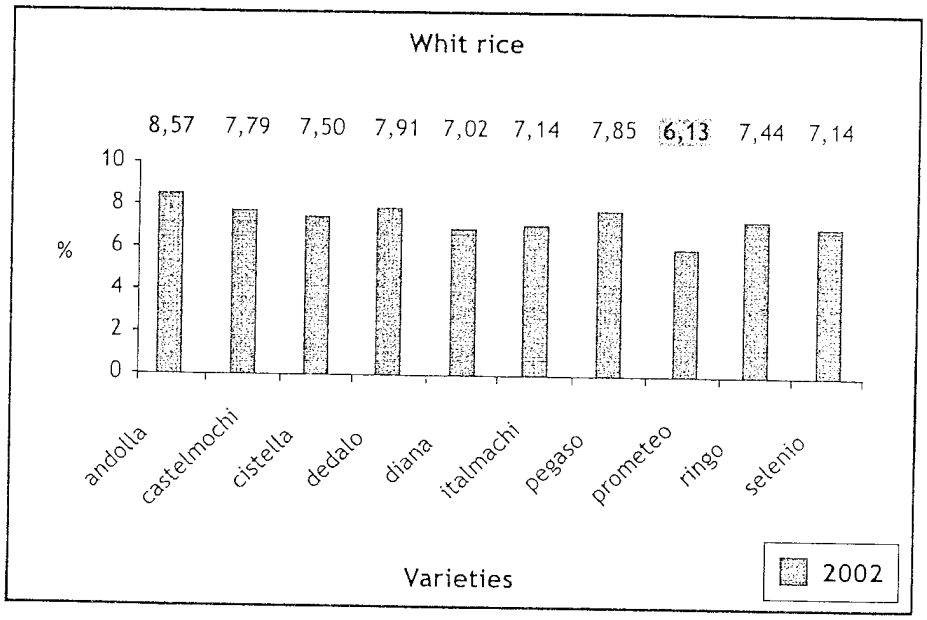
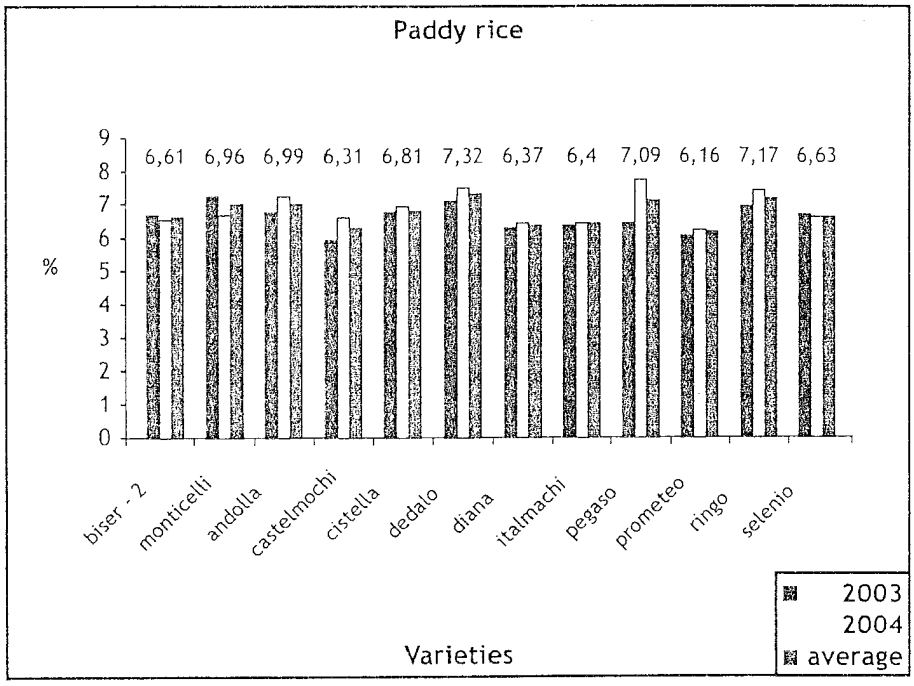
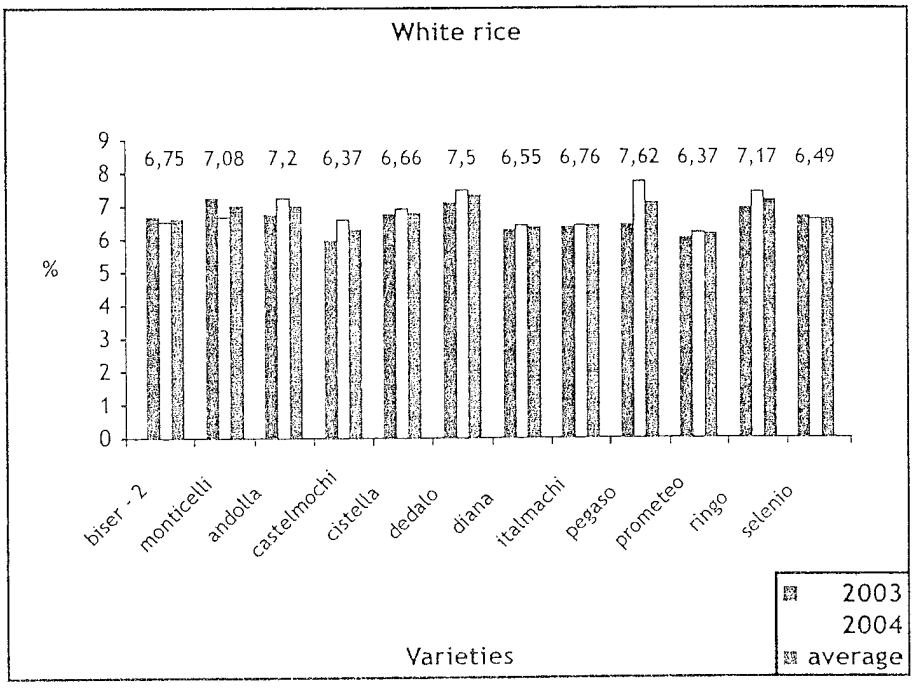


Figure 2 *(Content of crude protein in grain of diferent Italian rice varieties grown in Kocani-R. Macedonia)*





CONCLUSION

Results based on performed experiments:

- There has been noticed a significant decreasing in the contents of total nitrogen and proteins in paddy and white rice, analysing the Italian varieties of rice grown in the conditions of the area of Kocani-Macedonia in 2003. It tends to increase in the next year, 2004.
- The biggest average content of proteins in grains of Italian varieties grown in Macedonia (average 2003/2004) is found in the variety *dedalo* (paddy: 7,32%) and the variety *pegaso* (white rice: 7,62%), and the least one in: *prometeo* (paddy: *6,16%)* and *prometeo* and *castelmochi* (white: 6,37%).
- The average content of proteins in the grains of standard varieties is: *biser-2* (paddy: 6,61%; white: 6,75%) and *monticelli* (paddy:6,96%; white:7,08%).

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