

PHYSICAL, CHEMICAL AND BIOLOGICAL PROPERTIES
OF WINTER RAPE SEEDS DURING THE PERIOD OF RIPENING

H. ZUKALOVÁ, J. VAŠÁK

University of Agriculture, Department of Crop Production
165 21 Prague 6 - Suchdol, Czech Republic

ABSTRACT

At the end of ripening of winter rape seed content of phospholipids and its distribution was stabilized. Content of diacylglycerols were 0,2 %, phosphatidylethanolamin 0,05 - 0,13 %, posphatidylinositol 0,04 - 0,16 % and phosphatide acids 0,02 %. Only glycolipide content decreased softly during the ripening period. The week before harvest time the free fatty acids appeared giving the evidence of immature rapeseed. The low phosphatide acid content gives the evidence in a favour of little phospholipase D activity.

Deforming deposits of rapeseed were higher at the seeds with higher moisture - immature and the lowest at the seeds in the week after harvest time. Higher temperature at the drying seed influenced its higher firmness.

INTRODUCTION

Knowledge of the qualitative and quantitative composition of lipids rapeseed is necessary for proper utilization and plays an important role of its processing. The content and distribution of phospholipids strongly influenced properties of oil, as well as its behaviour during extraction [Goraj - Moszora et al., 1987]. The behaviour of winter rapeseed during storage and extraction is in connection with deforming deposits of seeds [Davison et al., 1975].

Considering that, were determined the content and distribution of phospholipids and firmness of rapeseed during maturation.

MATERIAL AND METHODS

Mechanical and chemical feature of winter rapeseed were observed at the Ceres variety in the week before harvest time, at the harvest and one week after harvest. The rapeseeds were dried at 40-50°C, 100°C and 130°C.

The analysis of content and distribution of phospholipides in the rapeseed oil obtained from variety Ceres by method of Folch, were determined on the Iatroscan TH 10 Mk IV [Iatron Lab., Japan] with stationary phase Chromarods S II. The phospholipids were determined in two-steps.

1. Total content of phospholipides at the condition TLC - FID were determined by a simple elution: benzene : ethylacetate : acetic acid : water [100 : 4 : 0,6 : 0,2].
2. Distribution of phospholipides were determined by gradual elution in three systems.
 - a. chloroform : methanol : water [78 :28 : 2,5]
 - b. benzen : chloroform : ethanol : formic acid [40:50:10:4]
 - c. hexan : diethylether : formic acid [97:3:0,1]

Flowrate: Hydrogen 160ml/min

Air 2,1l/min

During the winter rapeseed ripening were observed: thousand seed weight, water of content. Deforming deposits were determined at the universal tearing machine FPZ 10/1.

RESULTS AND DISCUSSION

Content and distribution of phospholipide during the end of ripening were stabilized, when content were:

diacylglycerol [0,2 %], phosphatidylethanolamin [0,05 - 0,13 %], phosphatidylinositol [0,04 - 0,16 %] and phosphatide acid [0,02 %]. Only glycolipide contents decreased during the ripening period respectively. The low phosphatide acid content gives the evidence in favour of little phospholipase D activity. The week before harvest were the free fatty acids discovered giving the evidence about immature rapeseed.

Thousand seed weight [TSW] was the highest in the week before harvest at 40 °C - 50 °C and with increasing temperature TSW and water of content decreased. This is in conformity with creation TSW and content of water during ripening. Mechanical damage of seeds was characterised by deformation curve with characteristics value. The

mechanical damage increased with the increase of seed moisture content. The lowest firmness had rapeseed in the week before harvest with more moisture, in comparison with ripened rapeseed. This damage is characterised by a force F_1 . At this point was observed the deformation in the shape of seeds. The total disruption of seed was caused by force F_{max} . In connection with force there were deformations X_1 , X_{max} and relative value apply to diameter [d] of seeds.

CONCLUSION

- the lowest firmness had the rapeseed in the week before harvest
- the highest content of free fatty acid was in the week before harvest
- the content and distribution of phospholipides at the end of ripening were stabilized, only glycolipide content softly decreased during the ripening period.
- immaturated rapeseed was characterized besides the content of chlorophyll, by a low firmness, high content of free fatty acids and which significantly lowered the rapeseed technological value.

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