Impact of Quince Flour on Gluten-free Muffins Production

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ABSTRACT

This study aimed to obtain gluten free muffins, with increased nutritional and sensorial value by adding quince flour into a composite flour. To optimize the recipe, four experimental variants using rice, soy, quince flours and starch in different proportions have been proposed. Quince is a rich source of vitamins, minerals, polyphenolic compounds and fibres. The quince flour addition led to muffins with increased content in minerals and very good sensorial properties in terms of taste, flavour, texture and general acceptance. It could be concluded that quince flour is a suitable source for obtaining gluten free muffins. Quince flour addition in aglutenic muffin composite flour up to 10% did not affect negatively their phisico-chemical and sensorial properties.

Keywords: *quince flour, muffins, gluten free product*

INTRODUCTION

The consumption of gluten free food is increasing in today's society and consumers are demanding more from their gluten free products motivated by health concerns but also by the desire to avoid wheat in the diet. Conventional gluten-free muffins are based on rice flour with low content of mineral and phenolic compounds. Quince belongs to the *Roseaceae* family and their well-established beneficial properties to human health were found mainly related to their phenolic content. It was reported that quince pulp extract showed a superior phenolic content than apple and pear pulp (Trigueros et al., 2011). Six phenolic compounds: 3-O-, 4-O-, 5-O-caffeoylquinic acids, 3,5-O dicaffeoylquinic acid, quercetin 3-galactoside and rutin were identified in quince. Previous studies showed that quince fruit is a good source of phenolic acids, flavonoids and organic acids, which are considered potent antioxidants (Branca et al., 2004).

AIMS AND OBJECTIVES

This study aimed to obtain gluten free muffins, with increased nutritional and sensorial value by adding quince flour into a mix of rice flour, soy flour and corn starch.

MATERIALS AND METHODS

The quince flour (QF) was made by drying the sliced fruits, grounding and sieving. Drying was respectively carried out in an oven at 50°C for 12 h, and 1 hour at 60°C. QF resulted with 5.01 % humidity and 1.56% ash content. The control sample (V0) used a composite flour made of 60 % rice flour (RF), 10% soy flour (SF), and 40% corn starch (CS) (40%). For the other experimental variants (V1,V2,V3) different percentages (10%, 20%, 30%) of QF were used as substitute in the control composite flour, as seen in Table 1. In the aglutenic muffins formulation other raw materials were used as following: butter (42%), sugar (60%), milk (33%), egg (50%) and baking powder

Tab. 1 Chemical characteristic for aglutenic muffins

Experimental variants		Chemical Parameters		
RF :SF: CS :QF		Moisture %	Ash %	Fat%
V0	60:10:40:0	16.96	0.85	11.12
V1	45:9:36:10	16.71	1.01	11.11
V2	40:8:32:20	16.31	1.04	10.92
V3	35:7:28:30	16.23	1.13	10.78

All analyses were made in triplicate and mean value was recorded

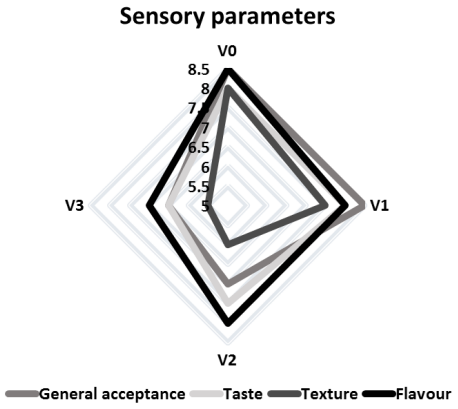

Fig. 1. Results of hedonic tests

(2%), without any modifications of their amounts for all variants. QF was analysed for insoluble fiber content (AOAC 991.42) polyphenols and DPPH activity (Mir et al., 2016). All raw materials were purchased from markets of specialized stores. The final products were analyzed for chemical parameters such as: moisture, ash, fat content, according to standards of AOAC (Association, 2000). A 9 points hedonic test was used for asses the muffins sensorial attributes.

RESULTS AND DISCUSSION

QF's content in insoluble fibers was 21.26%, total phenolics 75.67 mg GAE/100g, while DDPH radical scavenging activity 80.75%. The values of analyzed chemical parameters for studied samples are presented in table 1. Increased content of QF led to muffins with enhanced content of ash since QF is the richest mineral source from the flours used. A slight decrease of the moisture and fat content of muffins is due to the QF addition which had a very low contents in moisture and fat contents. Taste, flavour and general acceptability reached high scores for all experimental variants with added QF. Texture reached also good scores, mainly for V1 samples. Due to their high content in insoluble fibers (Gyurova et al., 2014) total phenolics and DDPH radical scavenging activity (Mir et al., 2016) and due to very good sensorial properties, QF is a suitable for aglutenic muffins production.

CONCLUSION

The addition of up to 30% quince flour doesn't change negatively the quality of the finished product and led to a product which contains more bioactive compounds but, the best sensory results was obtained by replacing the mixed flour with 10% of quince flour.

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