



THE EFFECT OF BALANGU SHIRAZI (*LALLEMANTIA ROYLEANA*) GUM ON THE QUALITY OF GLUTEN-FREE PAN BREAD CONTAINING PRE-GELATINIZED SIMPLE CORN FLOUR WITH MICROWAVE

Mahdi Jalali¹, Zahra Sheikholeslami^{2*}, Amir Hossein Elhamirad³, Mohammad Hossein Haddad Khodaparast⁴, Mahdi Karimi⁵

^{1,3}Department of Food Science and Technology, Sabzevar Branch, Islamic Azad University, Sabzevar, Iran

^{2,5}Agricultural engineering research department. Khorasan Razavi agricultural and natural Resources research and education center, Agriculture Research, Education and Extension Organization (AREEO) Mashhad, Iran

⁴Department of Food Science and Technology, Ferdowsi University of Mashhad, Mashhad, Iran

*shivashsheikholeslami@yahoo.com

<https://doi.org/10.34302/crpjfst/2019.11.2.6>

Article history:

Received:

25 August 2018

Accepted:

1 March 2019

Keywords:

Electronic microscope

Image processing

Local gum

Microwave

Pre-gelatinized flour

ABSTRACT

In this study, pre-gelatinized simple corn flour with microwave and three levels of Balangu Shirazi gum were used in producing gluten free bread. The substructure of two types of flour was evaluated using the electronic microscope. The properties of bread samples including moisture, specific volume, porosity, crust color, texture and overall acceptance were studied. The results of electronic microscope showed that the granular structure of corn flour was coherent. However, the granular structure of pre-gelatinized corn flour had more structural expansion and swell because of demolished heat. In addition, samples containing pre-gelatinized corn flour and 2% Balangu Shirazi gum had the highest humidity in the first (22.5%) and third (19.4%) day. The highest porosity (23.3% and 23.5%) and specific volume (4.9 and 5.1 cm³/g) and the minimal texture firmness were observed within 1 day after manufacturing (4.8 & 4.9 Newton) in samples containing pre-gelatinized corn flour and two levels of Balangu Shirazi gum (1% and 2%). Moreover, the results showed that increased L* colorful component (52% increase) caused by using the pre-gelatinized corn flour and raising the consumption level of gum. The presence of gum didn't have a significant impact on two colorful components such as a* and b*. The use of pre-gelatinized corn flour resulted in decreasing b* colorful component. Also, sensory evaluations gave the highest score of overall acceptance to samples containing pre-gelatinized corn flour and two levels of Balangu Shirazi gum (1% and 2%).
