Development and Evaluation of Guar Gum-Based Mayonnaise in Combination with Pumpkin and Sesame Seed Oil Blends

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ABSTRACT

Keywords: Agro-industrial waste, Guar gum,Mayonnaise, Pumpkin seed oil, Sesame seed oil

INTRODUCTION

In recent years, pumpkin has gained substantial attention because of the health benefits and nutritious value of the seed oil. Pumpkin seeds generally considered as agro-industrial waste and are useful source of unsaturated fatty acids that are lacking in modern diets. Sesame and pumpkin seed oils have been shown to have health-promoting properties. Because of their unique texture and great nutritional content, they are considered as one of the best edible oils. Increased consumer awareness towards cholesterol and overconsumption of saturated fats as well as under consumption of healthier dietary components has prompted the development of these healthier variants. Pumpkin and sesame seed oil contain natural antioxidants such as tocopherol, carotenoids, sesaminol, sesamin, and sesamolin lignan fractions, which play a significant role in its oxidative stability.

OBJECTIVE

This research was conducted to characterize the pumpkin and sesame seed oil and to evaluate their impact on oxidative stability and sensory attributes of mayonnaise.

METHODOLOGY

The pumpkin and sesame seed oils were extracted using solvent extraction technique. After the extraction, the oils were subjected to analyse the different physicochemical characteristics (free fatty acid, iodine value, peroxide value, saponification value, specific gravity, acid value, refractive index, and smoke point). Fatty acid profile of pumpkin and sesame seed oil wasanalyzedon a (GC-17 SHIMADZU) gas chromatograph equipped with flame ionization detector (FID) using a DB WEX 30M 0.25 mm column. After the oil analysis, it was utilized in the development of mayonnaise. Different mayonnaise treatments were prepared including two control treatments containing egg yolk and guar gum, and mayonnaises containing different ratios of pumpkin and sesame seed oil (100:0, 75:25, 50:50, 25:75, 0:100), respectively. All the samples were packed in plastic cups and kept at 15±1ºC until further analysis during the storage period of 60 days. To check the overall quality of mayonnaise the physicochemical analysis (free fatty acids, iodine value, pH, viscosity), antioxidant activity analysis (DPPH and FRAP assay), and sensory evaluation were performed during the storage period of 0, 15, 30, 45, and 60 days. The lipid phase was extracted from the mayonnaise for the analysis of free fatty acids, iodine value, DPPH, and FRAP.

RESULTS/CONCLUSION

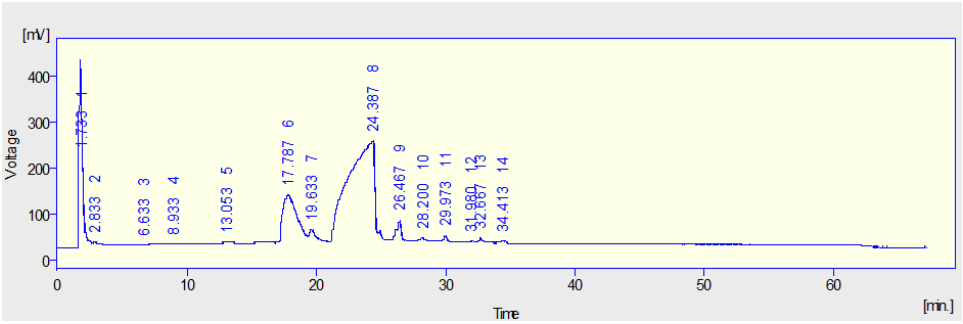

Figure 1. Gas chromatography profile of pumpkin seed oil sample

Table 1. Fatty acid profile of pumpkin seed oil

Sr. No.	Fatty Acid	Retention time	Peak area(%)
	Solvent (methanol)	1.733	13.5
1.	Pentadecane (Internal Std)	2.833	0.8
2.	Cis-10 pentadecanoic acid (C15:1)	8.933	0.6
3.	*Palmitic* acid (C16:0)	17.787	18.5
4.	Stearic acid (C18:0)	19.633	2.7
5.	Cis-9-oleic acid (C18:1)	24.387	59.7
6.	Linolenic acid (C18:3)	28.200	1.6
7.	Linoleic acid (C18:2)	29.973	1.9
8.	Arachidic acid (C20:0)	31.980	0.7

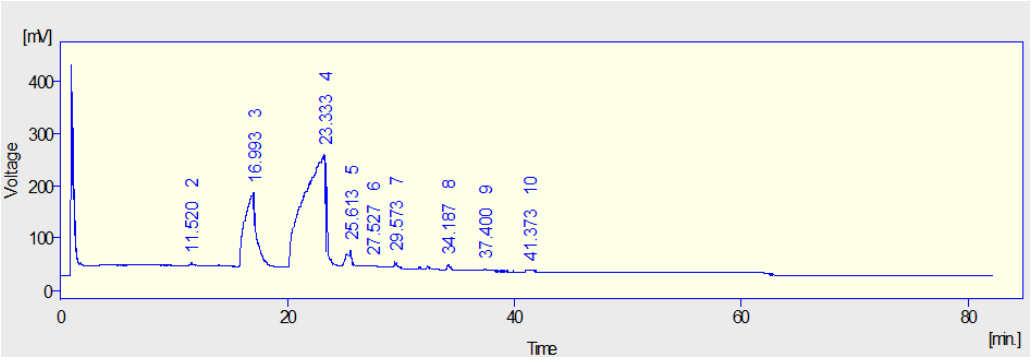

Figure 2. Gas chromatography profile of sesame seed oil sample

Table 2. Fatty acid profile of sesame seed oil

Sr. No.	Fatty Acid	Retention time	Peak area (%)
	Solvent (methanol)	0.953	11.9
1.	Myristic acid(C14:0)	11.520	0.6
2.	Palmitic acid (C16:0)	16.993	19.7
3.	Cis-9-oleic acid (C18:1)	23.333	60.8
4.	Linoleic acid (C18:2)	25.613	2.9
5.	Linolenic acid (C18:3)	27.527	1.7
6.	Cis-11,14-eicosadienoic acid (C20:2)	29.573	2.4

According to the study sesame and pumpkin seed oil was shown to be useful in reducing oxidation in mayonnaise but not good in sensory perception. Because of the presence of fatty acids including oleic, palmitic, linoleic, and stearic acids, these findings suggest that sesame and pumpkin seed oils are beneficial food oils. These fatty acids are a good source of nutrition, and until now, pumpkin seeds were thought to be an agro-industrial waste. As a result, if correctly utilized, these oils could function as vegetable edible oils, and their production provides a means of utilizing renewable resources while also adding value to agricultural wastes and reducing the waste disposal problem faced by agro-based industries. Its nutritious value provides a potential for industrialization. However, there is need to work on sensory parameters.

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