The Effect of Black cumin seed (Nigella sativa L.) oil and aqueous extract on Physicochemical, Antioxidant Properties, and Shelf life of cupcake.

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Abstract:

Black cumin (*Nigella sativa* L.), (Seeds, oil and aqueous extract) have a long history as a medicinal herb and are commonly utilized in bakery products. The purpose of this research was aimed to study the effect of black cumin seed extracts as a substitute on physicochemical, antioxidant properties, and shelf life of cupcake. The making of cupcake recipes using black cumin seed (BCS) derivatives (oil BCSO + aqueous extract BCSE) in different proportions range from 0 to 100% substituted with butter (BCSO-25, BCSO-50, BCSO-75, and BCSO-100%), aquatic part (BCSE-25, BCSE-50, BCSE-75, and BCSE-100%) and without adding black cumin oil and aqueous extract has taken a control. and estimate the nutritional value, physicochemical characteristics, antioxidant activity, and storage stability of cupcake storage at ambient temperature for 28 days. According to the study, black cumin fixed oil and aqueous extract have a high nutritional content such as total phenolic was 2119±24.50 , 748.33±12.85 mg GAE/100 g, total flavonoids was 2.19±0.01 and 2.05±0.10 mg QE/g, respectively and fatty acid profile. The results indicated that the proximate analysis of the different concentrations of cupcake were showed to differ significantly (p<0.05) from the control in terms of moisture, ash, protein, fat, and carbohydrate. Compared to the control, the cupcakes sensory values were reported to be acceptable. The increased BCSO and BCSE level in the cupcake recipe reduced the breakdown of fats. The acid and peroxide values in cupcake samples containing (BCSO-100% and BCSE-100%) after 28 days of storage at room temperature were (3.22±0.09and3.89±0.19mgKOH/g)and (6.24±0.1and6.86±0.12 (meqO_2/kg) respectively, compared control was (7.87 mg KOH/g and 10.03±0.07(meqO_2/kg) respectively. The results also observed that microbial activity in cupcake (Total bacterial count, mold &yeast and *E.coli*) reduced with increasing the percentage of BCSO + BCSE. This results concluded that utilization of black cumin seed oil and aqueous extract resulted in improvement the physicochemical, antioxidant properties, and shelf life of cupcake