أنموذج (أ) الخاص برسائل الماجستير و اطاريح الدكتوراة (اخر شهادة)

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Thesis Title	Study of Physico-Chemical Properties of Local Black Seed Oil (*Nigella sativa* L.) and Its Utilization in Food Processing			
Year	٢٠٠١			

Abstract	Oil was extracted from the seeds of local black cumin *Nigella sativa* L., by two methods, the solvent extraction with hexane, and the mechanical press. The yield of oil was 37.5% and 12.5%, respectively. The oil extracted with hexane was bleached with Fuller's earth, the obtained yield was 16%. The fatty acid contents of extracted oil by two methods was as follows: 2.8% Myristic acid; 16.6% Palmitic acid; 0.8% Stearic acid; 13.7% Oleic acid; 64.2% Linoleic acid and 1.9% Arachidic acid. The protein content in black cumin seed was 28%, which became to 47.7% in the meal obtained after hexane extraction. The physical and chemical properties of the black cumin seeds were examined, the obtained results were as summarized: The physical properties: The oil extrated with hexane had the following characters: colour: Yellow 70/Red 7; specific weight 0.912 at 20 ˚C; Refractive index 1.471 at 25˚C; Relative viscosity 42.98; Boiling point 160˚C; Smok point 191 ˚C; Flash point 207 ˚C; Burn point 224 ˚C and Titer point 22˚C. The oil extracted by mechanical press, had the following characters: colour: Yellow 70/Red 7; specific weight 0.94 at 20 ˚C; Refractive index: 1.474 at 25 ˚C and Relative viscosity 49.95. C. The oil extracted with hexane and bleached with Fuller's earth had the following characters: Colour: Yellow 70/Red 43; Specific weight 0.94 at 20 ˚C; Refractive index 1.473 at 25˚C and Relative viscosity 51. 48. 5 . 2 . The chemical properties: The oil extracted with hexane had the following values: Acid value 4.6 mg KOH/g oil; Saponification value 192.2 mg KOH/g oil; Unsaponifiable matter 2%. Iodine value 123; Ester value 187.6 and Peroxide

value 10 meq/kg oil. There was no evidence of rancidity as alkaline colour test revealed.

The oil extracted with hexane and bleached with Fuller's earth had the following values:

Acid value 0.6 mg KOH/g oil; Saponification value 192.2 mg KOH/g oil; Unsaponifiable matter 2%; Iodine value 123; Ester value 191.6 and Peroxide value 2 meq/kg oil. There was no evidance of rancidity as alkaline colour test revealed.

The bleached oil was used in processing some food products as follows:

A: cookies products:

Black cumin oil was added to 5 cookies mixes in different ratios , (A) 0%; (B) 25%; (C) 50%; (D) 75%; and (E) 100%., instead of sunflower oil.

The statistical analysis for the organoleptic evaluation showed that, there were no significant differences ($p < 0.05$) for appearnce, texture, tenderness and Flavour, among the five mixes. There were also no significant differences ($p < 0.05$) for the crumb colour between A and B and C and D, while there were differences between A and B with E. and A and B with C, D. C, D with E.

The statistical analysis also showed that there were no significant differences ($p < 0.05$) in the over all acceptance among the five mixes.

Fried potato finger (potato chips):

Two batches of potato fingers were fried with black cumin oil (A) and sunflower oil (B).

The statistical analysis for the organoleptic evaluation showed no significant differences ($p < 0.05$) in texture and flavour, between A and B while there were significant differences for the colour of the fried fingers between A and B as B being the best.

Cooked Rice :

Two batches of rice have been cooked with black cumin oil (A), and

	sunflower oil (B). The statistical analysis for the organoleptic evaluation showed that there were no significant differences ($p < 0.05$) between A and B for the leavening character, while there were significant ($p < 0.05$) differences in flavour of the rice between A and B. as B being the best.