Full Length Research Article
Advancements in Life Sciences – International Quarterly Journal of Biological Sciences

Open Access

Separation and partial purification of lecithin: cholesterol acyltransferase from serum of obese women with a study of the effect of oily and nano-extract of Castanea fruit in activating the enzyme

Abstract

Background: The Chestnut plant is one of the important plants for treating many diseases. Therefore, the oil extract of the Chestnut plant was taken to know its effect on activating an enzyme of lecithin: cholesterol acyltransferase that decreases in obese patients, by isolating it from the blood and using nanotechnology methods.

Methods: The research included the isolation lecithin: acyltransferase cholesterol (LCAT) from the blood of 5 obese women, whose BMI was between 25-30 kg/m2, ages ranged from 40-45 years, and they were healthy without any diseases. The oil extract of Chestnut fruit was isolated. Fatty acids present in the oil extract were identified using capillary gas chromatography technique CGC, as the extract contained a percentage of unsaturated fatty acids and a lower percentage of saturated fatty acids. The enzyme was precipitated with ammonium sulfate, dialysis technique, and the gel filtration chromatography technique was used in purification. Finally, effect of the oil extract of the Chestnut fruit was studied at a concentration of (0-100) mg/ml and the nanoparticles-oil extract also on the activity of the LCAT (0-20) mg/ml. The nanoparticles of silver nitrate were prepared at a concentration of 1 mM with the oil extract of the Chestnut fruit and heated at a temperature of 60°C.

Result: The highest peak was obtained from the gel filtration chromatography, which was highly effective. The number of purification times reached 91.72, and the recovery rate was 283.33%, and the effectiveness was qualitative 457.69 U/mg. Oil nanoparticles extraction was confirmed when the solution was transformed by changing its colors from colorless, yellow, orange, and finally coffee in color. The results showed an increase in the activity of the LCAT when treated with the two extracts, also the increase in the activity had a higher effect on the activity of the enzyme.

Conclusion: We concluded during the study that the extract of the fruit of the oily nanoparticles was more effective in increasing the activity of an enzyme lecithin: cholesterol acyltransferase in healthy women with obesity.