ISSN: 0975-8585

Research Journal of Pharmaceutical, Biological and Chemical Sciences

Hypo-lipidemic Effects of Aqueous Extract of *Daucus carota seeds* (*Daucus carota* L.)Induced Atherogenic Diet in Wister male Rats.

Haider Salih Jaffat and Enas abd al- raouf ammar semysim

Department of Biology, faculty of Science, University of Kufa, Iraq.

ABSTRACT

Daucus carota seeds a common uses alliteration types and well known medically plants have been reported to have anti blood sugar anti oxidant stress and anti fungi properties . we have investigated its anti hyper fats using aqueous extract obtained from seeds . The study was divided into four groups : (10 rats in each group) for ten weeks, Include gives high cholesterol diet . Group one control animals administered normal saline only, Group two was administrated 100g/kg of volume dose from HCD only, Group three was administrated 1 ml/kg of volume dose from Daucus carota seeds at concentration 100 mg/kg plus 100g/kg of HCD, Group four was administrated 1 ml/kg of volume dose from Daucus carota seeds at concentration 200mg/kg plus 100g/kg of HCD, At the end of the treatment period , rats were scarified serum sample was obtained for the assessment of parameters lipid profile the result shown, that HCD has significantly decreased ($p<0.05$) in total cholesterol, TG, LDL, HDL and VLDL and body weight.

Corresponding author

ISSN: 0975-8585

INTRODUCTION

Daucus carota Linn, common known as Carrot , belongs to the family (Apiaceae Umbelliferae) and is cultivated almost all over the world as a useful vegetable, carrot is widely consumed as an aphrodisiac and nervine tonic and its scarped root is used as a topical stimulant for indolent ulcers , the plant has undergone extensive phyto chemical studies and large number of active ingredients have been isolated. These include volatile oils, steroids, tri terpenes, carbohydrates, glycosides, tannins, flavonoids, amino acid, carotene and hydro carotene. [1,2,3] .Its water extract has antioxidant properties and it could be a potential therapeutic for the pathologies linked with the breaking due to free radicals[4]. Usually the elevated level of lipoprotein and lipids in the blood is usually so-called hyper lipidaemia American Heart Association, [5]. increase fats is whatever risk factor for coronary artery disease (CAD) therefore reduction elevated fats is crucial for primary and secondary prevention , foods treatment but also drug therapy is frequently needed to reduction the cholesterolin in the blood .[6]

Hypercholesterolemia is one of the major modifiable risk factors for Atherosclerosis and Coronary Heart Disease (CHD). The CHD is the cause of 25-30 per cent of deaths in most industrialized countries. The WHO has drawn attention to the fact that CHD is our modern "epidemic''. The most complications of although hypercholesterolemia are atherosclerosis [6,7]. Result of hyper triglyceridemia is lipemia but not hypercholesterolemia [8, 9]. Hyper lipidemia is a disorder of lipid metabolism manifested by the elevation of plasma concentration of various lipids (triglyceride and cholesterol) and lipoproteins fractions (Low-Density Lipoprotein, Very Low-Density Lipoprotein). It may result from primary abnormality in lipid metabolism either (a) monogenic (strictly hereditary), (b)polygenic (due to a combination of dietary fat, obesity and individual susceptibility), or from secondary manifestations of other conditions like liver and biliary disease, beefy, peaches, blood sugar, foods , alcohol excess, kidney disease and drugs (including oral contraceptive steroids, glucocorticosteroids, etretinate, thiazide diuretics etc.) women tend to have high triglycerides and low density lipoprotenis cholesterol levels and decreased levels of high density lipoproteins cholesterol, hyper triglyceridemia and low are more whatever risk factors of CHD for women than for men [10,11, 12,13] .

Increased blood cholesterol level is considered to be a risk factor for coronary heart disease. Foods and pharmacologic reduction in total and LDL cholesterol decreases the risk of coronary diseases and foods intervention is the desirable approach. Many investigators have reported that soluble dietary fiber has the ability to lower plasma cholesterol concentration in experimental animals and in humans [10,11,12]. *Daucus carota* (carrot) is an excellent source of antioxidant compounds which help protect against cardiovascular diseases, cancer and also promote good vision . It aids detoxification by enhancing urine flow and removal of waste by kidneys [13] . it improves lung health and has demonstrated an inverse association with insulin resistance and high blood sugar levels [14] . Protective effects of carrot have been reported against CCl4 induced hepatotoxicity [15]. therefore it is considered appropriate to investigate its effect on hepatotoxicity caused by CCL4.

MATERIALS AND METHODS

Aqueous extract of Daucus carota seeds was prepared by maceration method with slight modification. A total 10 g of the Daucus carota seeds powder was steeped in 100 ml of sterilized distilled water for one day, and then filtered through eight layers of cotton. It was further filtered by using filter paper (What man No.1) and centrifuged at 3000x for 10 minutes, and then the filtrated was kept in a freeze dryer for 48 hour yielding solid residues of Daucus carota seeds [16, 17] . At the end of experimentation, (after 10 weeks). Each animal was anaesthetized by mixture of xylocaine 0.2ml and ketamine 0.1 ml and they were scarified [18]. Heart puncture was done with a 5 ml disposable syringe and 2-5 ml blood was drawn very gently and slowly. Each blood sample was put in a tube without EDTA and left for half an hour in room temperature and used to obtain serum via centrifugation at 3000 rpm for 15 minutes and kept at -20 in a freezer for determination biochemical analysis.

ISSN: 0975-8585

Biochemical Assays.

Colorimetric determination of ALT&AST activity according to the Reitman's and Frankel method [19]. by using biomerieux kit. Colorimetric determination of ALP according to [19] . Kind and king method by using biomerieux kit. Total cholesterol kit for quantitative determination of total cholesterol in human serum was supplied by Bio lab SA, France,[19] . Serum HDL-Cholesterol level was measured by HDL-Cholesterol phosphor tungsten acid (PTA) precipitant kit (Bio lab SA, France) [20] . Triglycerides Kit was supplied by Bio lab SA, France. For measureable of triglycerides in human serum [21]. Very Low Density Lipoprotein (VLDL) was measured by the next principle: VLDL = TG (mg/dl)/5 [20]. Assessment of low density lipoprotein level Low Density Lipoprotein (VLDL) was measured by the next formula: LDL=TC(mg/dl)-VLDL(mg/dl)-HDL(mg/dl) [20] .

High fat diet-induced hypercholesterolemia.

The Wister male Rats were fret with hyper cholesterolemia diet for 10 weeks to develop hyper lipidemic an exception rats normal control groups rats which take normal food . The installation of hyper cholesterol food was cholesterol (1%) , cholic acid (0.5%), casein (20%), choline (0.25%), D- l-methionine (0.4%), coconut oil (25%), multi vitamin mix (3.5%) and sucrose (48.4%) Growth rate was monitored during the treatment [22] .

RESULTS

Table (1) show initial body weight and final weight, also weights of liver and kidney in male rats fed a high cholesterol diet. There were significant increase final weight compare in initial weight in animals gives DCS when compared with control.

Significant decrease ($P<0.05$) in final weight in male rats fed a high cholesterol diet with DCS when compared groups of HCD plus Daucus carota seeds aqueous extract . 200mg/kg and 100 mg/ kg with control, also show significant decrease ($P<0.05$) in liver weight and kidney in male rats fed a high cholesterol diet when compared all groups with control .

Table 1: Effect of *Daucus carota seeds* L. aqueous extract on weights of male rats and their organs treated for 10 weeks.

Groups	Changes in body weight (gm)	Liver weight %	Kidney weight%
Control	25.00±4.70	3.11 ±0.580	2.17±0.128
HCD	*40.00 ±6.00	*5.06± 0.332	*4.39 ± 0.204
HCD+DCS 100	*24.00±3.47	*2.99± 0.066	*2.00 ± 0.567
HCD+DCS 200	20.00±1.55*	2.88 ± 0.044*	2.10 ± 0.09*
L.S.D. 0.05	5.456	0.44	0.122

Values are mean ±SE. *Significantly different at p<0.05

In table (2) shows the effect of Daucus carota seeds aqueous extract on lipid profile , show increase in all lipid profile parameter in group of male rats fed a high cholesterol diet as compared with control group, significantly Daucus carota seeds aqueous extract decrease ($p< 0.05$) all lipid profile parameter group of female rats fed a HCD plus Daucus carota seeds aqueous extract .

Table2: Effect of *Daucus carota seeds* L. aqueous *extract* on lipid profile in male rats fed a high cholesterol diet for 10 weeks.

Groups	Serum TC	Serum TG	Serum HDL	SerumLDL	serum VLDL
Control	110.8±2.11	210.6±1.33	44.3±2.23	40.9±1.58	15.8±1.66
HCD	*300.0±11.97	*270.8± 2.88	*29.4±2.88	*90.9 ±4.77	*49.8 ±8.66
HCD+DCS 100	*120.2 ±2.22	*220.0 ±3.44	*36.4 ±1.22	*56.9 ±3.78	*35.7 ±2.00
HCD+DCS 200	110.8±1.44*	115.0 ±2.99	38.6±1.8*	55.7 ±1.77	14.5±1.22
L.S.D. 0.05	2.999	5.769	1.22	3.765	1.999

Values are mean ±SE. *Significantly different at p<0.05

ISSN: 0975-8585

In table (3) shows the effect of Daucus carota seeds aqueous extract on serum liver function test , show increase in all AST ,ALT, ALP in group of male rats fed a high cholesterol diet as compared with control group, Daucus carota seeds aqueous extract significantly decrease ($p< 0.05$) AST ,ALT, ALP group of male rats fed a HCD plus *Daucus carota seeds* aqueous extract**.**

Table3: Effect of *Daucus carota seeds* L. aqueous *extract* on liver function test in male rats fed a high cholesterol diet for 10 weeks.

Groups	Serum AST U/L	Serum ALT U/L	Serum ALP U/L
Control	62.8±2.66	33.6±2.66	40.2±1.33
HCD	*120.0±1.99	*70.0±2.55	*90.8±2.55
HCD+DCS 100	*70.2±3.09	*40.2±3.99	*55.4±3.57
HCD+DCS 200	*60.0± 1.99	35.6±2.55*	50.0±3.66*
L.S.D. 0.05	3.732	4.345	2.332

Values are mean ±SE. *Significantly different at $p<0.05$

DISCUSSION

Some there are reports are available on the anti hyper fats effect of *DCS* extract, thus in agreement with these results , it has been determined that the equates extract of *D. carota* seeds reduce cholesterol level in young and aged mice [23] . At last a number of medical studies suggest that the high risk of coronary heart disease is linked with a high serum concentration of TC , LDL-C and triglycerides, The unnatural high concentration of plasma lipids is mainly due to the increase in the movement of free fatty acids from the peripheral depots . [24,25]

Other recent research show that the administration of *D. carota* seeds extract for 3 days significantly decrease serum glucose, cholesterol, triglycerides, low density lipoproteins and very low density lipoproteins in serum levels [26, 27] .

The effect of aquatic Daucus carota seeds extract on lipid profile from the obtained result observed that significant rise in total cholesterol in group of rat fed a libitum in contrast to control rats. There results are similar to [28 ,29 ,30].

Soluble dietary fiber such as Daucus carota seeds has been explored for their ability to reduce plasma cholesterol and hence contributing significantly to cardio protective property . A relationship between fibre deficit diet and acceleration in the development of certain chronic and degenerative diseases has been hypothesized. [31,32] .

Daucus carota seeds is a dietary fibre advocated for use in lowering serum total cholesterol levels in patients with hyper cholesterolaemia The mechanism of action of cholic acid is two folds [33,34] an increase in cholesterols 7- a hydroxylase activity that that result in decrease cholesterol excretion [20,35] . cholic acid increase absorption of cholesterol by the emulsifying . Increased activity of liver enzymes are usually regarded as expressions of cellular necrosis, especially in hepatocytes. The increase in the levels of transaminase reflects a clear indication of cellular leakage and loss of functional integrity of the cell membrane, Assessment of liver function can be made by estimating the activities of serum AST, ALT, and ALP which are originally present in higher concentrations in cytoplasm. In liver damage, these enzymes leak into blood stream in conformity with the extent of liver destroy. [21] Elevation of the aspartames aminotransferase , alanine aminotransferase enzyme activities is considered as an evidence for hepatic damage , an increase of these enzymes activities is also associated with fatty liver disease and decrease hepatic insulin sensitivity in type two diabetic [22]. Therefore, possible explanations for hypo lipidemic effects of the levels of Daucus carota seeds, include the presence of Crude oil, sitosterol D-galactoside, pectin, quercetin, kaempferol and flavonoids [36]. It had been reported that Daucus carota seeds has inhibitory action against pancreases amylase and small intestine and glucosidase enzymes , this indicated Crude oil could inhibit carbohydrate absorption and metabolism [37,38] The effect of aquatic DCS extract on AST,ALP and ALT show raised in AST, ALP and ALT in group of rat fed a HCD as compared with control agree

with [39,40]. This effect can be attributed to many phenolic constituents in CF leaf which has the ability to strongly inhibit lipid profile and high concentration of flavonoids which are potent antioxidants and free radical scavengers As per previous studies conducted on antioxidant properties of *DCS* it has been seen that reduced the levels of lipid profile [41].

Daucus carota seeds extract significantly decline in ALP, AST and ALT in group treated with HCD plus concentrations Daucus carota seeds extract 100 mg/kg and in group treated with HCD plus concentrations Daucus carota seeds extract 200 mg/kg body weight, when compared with groups of animals that fed on a HCD only agree with [42 43]. The aim of the study is to effectively manage the important risk factor Hyper lipidemia with total herbal medicine, cost effective, easily available and no side effects is very much in need. The conclusion of the study is that the treatment with DCS (100 mg/kg, 200 mg/kg) significantly reduced the serum lipid levels over the ten weeks study.

REFERENCES

[1] Bishayee, A., Sarkar, A. and Chatterjee, M. Hepatoprotectiveactivity of carrot (*Daucus carota* L.) against carbon tetrachloride in mouse liver, J.Etnopharmacol ,1995, 47, 69–74.

[2] Antia B.S. Okokon J.E. Effect of juice of *Catharantus roseus* Linn oncholesterol, trigyceride and lipoproteins levels in normal rats, Indian J Pharmacol , 2005, 37, (6) :401- 402.

[3] Mohamad Osama A Turkmani ., Francois Karabet , Loubna Mokrani1, and Chadi Soukkarieh3, Chemical composition and in vitro antioxidant activities of essential oil from Nigella sativa L. seeds cultivated in Syria , International Journal of ChemTech Research,2015, 8 (10), 76-82.

[4] Hasani-Ranjbar S, Larijani B, Abdollahi M . A systematic review of the potential herbal sources of future drugs effective in oxidant related diseases. Inflamm. Allergy Drug Targets , 2009,(8) , 2-10.

[5] American Heart Association (2007). The American Heritage Medical Dictionary, Heart and Stroke Statistical Update.

[6] Abdul Aziz Fatriyawan , Chanif Mahdi1 and Aulanni'am Aulanni'am1, and DyahKinasih Wuragil , The Ethanolic Extracts Therapy of Ceremai Leaves (Phyllanthus acidus (L.)Skeels) on Malondialdehyde (MDA) Levels and Histopathology of Hepar of Hypercholesterolemic , Rats International Journal of ChemTech Research, 2016, 9, (04) , 509-512.

[7] Liu, J.; Sempos, C. T.; Donahue, R. P.; Dorn, J., Trevisan, M. and Grundy, S. M. , Nonhigh-density lipoprotein and very-low-density lipoprotein cholesterol and their risk predictive values in coronary heart disease. Am. J. Cardiol 2006, 98, 1363–1368.

[8] Johnson, M. C. , Hyperlipidemia Disorders in Dogs. Compendium on Continuing Education for the Practicing Veterinarian , 2005, 27,361–364.

[9] Afyaa Sabah Nasir , Haider Salih Jaffat , Effect of turmeric extract (Curcuma longa) on physiological parameters and neurotransmitters in rats treated by lithium carbonate. International Journal of PharmTech Research , 2016, 9 ,(2) , 89-97.

[10] Rideout TC, Harding SV, Jones PJ, Fan MZ. Guar gum and similar soluble fibers in the regulation of cholesterol metabolism: current understandings and future research priorities,*Vasc Health Risk Manag* 2008*, 4* , 1023-33.

[11] Cho IJ, Lee C, Ha TY. , Hypolipidemic effect of soluble fiber isolated from seeds of *cassia tora* Linn. in rats fed a high-cholesterol diet. *J Agric Food Chem ,* 2007, *55* , 1592-6.

[12] Afyaa Sabah Nasir , Haider Salih Jaffat . Protective role of turmeric extract (Curcuma longa) in the lipid profile and activity of antioxidant in the male rats treated by lithium carbonate. International Journal of PharmTech Research , 2016 , 9 , (2) , 98-105 .

[13] Das P, Himaja M ., Antioxidant anti-arthritic and hypoglycemic activity of International Journal of PharmTech Research , 2015 , 8, (7) , 51-57.

[14] Rosmidah Hasibuan , Syafruddin Ilyas , Saleha Hanum , Effect of leaf extract Haramonting (Rhodomyrtus tomentosa) to lower blood sugar levels in mice induced by alloxan , International Journal of PharmTech Research, 2015 ; 8 (6) : 284-291.

[15] Medhat M., Abozid , H. E. A., Farid , and EL-Sayed S. M . , Impact of flaxseed and oil extracted from Nile Tilapia waste on rats feed on high fat diet, International Journal of PharmTech Research, 2015, 8, (5), 938-945.

[16] Suchita Bhise , Sheela Kulkarni , Determination of Antioxidant Activity and Phytochemical Screening of Cucurbita maxima Duch. fruit extracts in non polar to polar solvents, International Journal of PharmTech Research, 2015 , 8 , (4) , 771-775.
[17] Harborne, J. B. Physiological Methods, a guide to modern techniques of plant analysis, 2nd Ed. Chapman and Hall. London, New York. 1984, 288p.
[18] Schiller, N. K. and McNamara, D. B. Balloon catheter vascular injury of the alloxan- induced diabetic rabbit, The role of insulin-like growth factor-1. Molecular and Cellular Biochemistry, 1999, 202,159-167.
[19] Sepideh Nourian , Ali Mohammadi Sani , Ebrahim Golmakani ,Peyman Feizi , Katayoun Roghani . Determination Antioxidant activity by High Performance Liquid Chromatography, Phenolic and Flavonoid contents of Vincetoxicum nigrum , 2016, 9 ,(3), 150-157.
[20] Reitman, S. and Frankel, S. 1957 . A colorimetric method for the determination of serum glutamic oxaloacetic and glutamic pyruvic .
[21] Tietz, N.W. Text book of Clinical Chemistry, 3rd Ed., C.A. Burtis, E.R. Ashwood, W.B. Saunders , 1999, 703-1699.
[22] Fossati, P. and Prencipe, L. L. Serum triglycerides determined colorimetrically with an enzyme that produces hydrogen peroxide, Clin. Chem , 1982, 28, 2077-2080.
[23] Majumder P, Dasgupta S, Mukhopadhaya R, Mazumdar U, Gupta M. Anti-steroidogenic activity of the petroleum ether extract and fraction 5 (fatty acids) of carrot (Daucus carota L.) seeds in mouse ovary. J Ethnopharmacol, 1997,57,209-12.
[24] F.A.El-Shobaki , E.A.Abdel-Reheim, Zeinab El-Hawary, Seham S.Kassaem . Protection from hypercholesterolemia and atherosclerosis by regular consumption of grape, apple or the extract, International Journal of ChemTech Research, 2015 , 8 , (10) , 169-178 .
[25] Ee Shian T , Aminah A , Nur Kartinee K and Shahrul Hisham ZA , Antioxidant and hypoglycaemic effects of local bitter gourd fruit (Momordica charantia), International Journal of PharmTech Research, 2015, 8, (1) , 46-52.
[26] Ylonen K, Alfthan G and Groop L., the Botnia Dietary Study. Am J Clin Nutr ., 2003 , 77 ,(6),1434- 1441.
[27] Nasdiwaty Daud , Rosidah , M Pandapotan Nasution Antidiabetic Activity of Ipomoea batatas L. Leaves Extract In Streptozotocin-Induced Diabetic Mice ,.International Journal of PharmTech Research , *2016* ,9 (3), 167-170.
[28] Attia AM, Shalaby MA, Lotfia BH and Reham SR., Faculty of Specific Education Journal , 2007 , 9, 170-190.
[29] Richmond, W. .Preparation and Properties of Cholesterol Oxidase from Nocardia species and its Applications to the Enzymatic Assay of Total Cholesterol in Serum,Clin. Chem 1973 ,19,1350-1356.
[30] Vasudevan M, Gunnam KK, Parle M. Antinociceptive and anti-inflammatory properties of Daucus carota seeds extract. J Heal Sci 2006,52,598-606.
[31] Rubila. S and Ranganathan T.V. Effect of Allium sativum paste against Antimicrobial, Antioxidant and Cytotoxicity activity . International Journal of PharmTech Research, 2016 , 9 , (3) ,328-332.
[32] Ranjbar B, Pouraboli I, Mehrabani M, Dabiri Sh and Javadi A. Effect of the methanolic extract of Daucus carota seeds on carbohydrate metabolism and morphology of pancrease in type I diabetic male rats. Physiol Pharmacol ,2010, 1,85-93.
[33] T. Nandini and D.Subhashini , Antioxidant Efficacy of Iron Nanoparticles from Aqueous Seed Extract of Cuminum Cyminum, International Journal of PharmTech Research,2015 , 8, (7) , 19-25.
[34] Pouraboli I and Ranjbar B. Effect of Daucus carota seeds extract on serum levels of Glucose, Lipids and Lipoproteins in type I diabetic male rats,Iran J Biol , 2012, 5,679-687.
[35] Aprilita Rina Yanti , Maksum Radji , Abdul Mun'im , and FD Suyatna . Antioxidant effects of Methanolic extract ofPhaleria macrocarpa (Scheff.) Boerl in fructose 10%-induced rats. International Journal of PharmTech Research , 2016 , 8 ,(9) , 41-47 .
[36] Ernawati, Tri Bintarti . Acute Toxicity Study Of Ethanolic Extract Of Solanum sanitwongsei Craib Fruits on Mice. International Journal of PharmTech Research , 2015 ,8, (4) , 642-647 .
[37] Moghadasian M. H. DVM, MSc, PhD Mini review Experimental atherosclerosis A historical overview, Life Sciences, 2002 , 70 855– 865.
[38] Preethi.J and Saranya.V.T.K. Phytochemical Analysis on Leaf Extract of Celosia argentea Land its Efficacy of Antioxidant and Anti Bacterial Activity. International Journal of PharmTech Research 2015 , 8 , (4) , 709-712.
[39] Sankar V, Shoba Fg . , Inhibitory effect of Phoenix pusilla unripe fruit on the enzymes, α-amylase and α-glucosidase , International Journal of PharmTech Research , 2015 , 8 , (1), 123-126.

[40] Ahmed Atia1, Nadia Alrawaiq1 and Azman Abdullah1 , Food Consumption and Body Weight in Mice Treated with
[41] Palm Oil–Derived Tocotrienol Rich Fraction (TRF), International Journal of PharmTech Research, 2016 , 9 , (3) , 262-266.
[42] Rosnani Nasution , Marianne , Mustanir , Merry Roswita , Anti-Obesity Compounds from the Leaves of Plants Morus Alba (MORACEAE) , International Journal of ChemTech Research, 2015 , 8, (10) , 228-234, 2015.
[43] Dubey, S. and Pande, V. V. Antihyperlipidemic activity of Sphaeranthusindicus on Atherogenic diet inducedhyperlipidemia in rats, International journal of green pharmacy ,2008, 2 ,(2), 125.