*Research Journal of Pharmaceutical Sciences*_____ __ISSN 2319 – 555X
Vol. **8(2),** 18-20, December **(2019)** *Res. J. Pharmaceutical Sci.*

Short Communication

Antihyperlipidemic activity of fresh juice of *Benincasa hispida* cogn.

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Available online at: www.isca.in, www.isca.me
Received 28th September 2019, revised 17th December 2019, accepted 23th December 2019

Abstract

India has a long history of traditional knowledge on dietary sources with medicinal properties that draws attention of the current investigation of Benincasa hispida, May not produces side effects while treating the hypercholesteremia and obesity. Evaluation of anti hyperlipidemic activity by using triton-x 100 along with atherogenic diet induced obesity and anorectic activity in animal models by fresh juice of Benincasa hispida dose 0.9ml/200g were Oral administration produces a significantly reduces the serum lipid parameters such as Cholesterol, Triglycerides, Low Density Lipoprotein (LDL), Very Low Density Lipoprotein (VLDL) and increased in High Density Lipoprotein (HDL) in rats as compared to control statistically. Our results shows that Benincasa hispida possess anti hyperlipidemic activity with no toxicity and better therapeutic of the treatment of anti-hyperlipidemia and anti obesity.

Keywords: Anti- hyperlipidemic, anti-obesity, anorexia, *Benincasa hispida*, triton-x-(TX)100.

Introduction

Hyperlipoproteinaemia (HPL) are conditions in which the concentration of cholesterol or triglycerides (TG) carrying lipoproteins in the plasma. Lipids and Proteins form complex called lipoproteins and circulate in the blood vessels. Hyperlipidemia may cause the risk of atherosclerotic arterial disease and peripheral artery diseases, stroke[1]. Hyperlipidemia significantly increases the levels of Cholesterol, Triglycerides, Cholesterol esters and reduces the High Density Lipoprotein[2].

A wide variety of chemical compounds have been synthesized from plants and their phytoconstituents, used to study various biological functions. Most of the herbal medicines have therapeutic effects on long term use in human and also used for ailments. Herbal medicines are effective as conventional medicines[3]. Now a day's many number of patients were using a herbal medicines[4]. World Health Organization notes that 74% of modern medicines were derived from the 119 plants producing pharmaceutical medicines and the plant medicines used as traditional by native cultures[5]. For a particular disease people believe it and support the plants that can be used to cure it[6].

Fresh juice is produces different types of enzymes, that enzymes are important for chemical reactions act as a catalyst, juices are often consumed for their perceived health benefits. Fresh juice is facilitates to cleaning the WBC in the blood and prevent the tissue from bacteria, fungi and viruses[7].

Materials and methods

Preparation of juice: The outer layer of the fruit was removed. The pulpy portion was cut into small pieces and churned without adding water. The churned pulp was filtered through muslin cloth.

The filtrate obtained was used for the phytochemical and pharmacological screening. Every day the fresh juice was prepared for screening the activities.

Animal - Wistar albino rat (200-250g), 6 rats are used and divided into 4 groups,

Test Drug- Fresh fruit juice of *Benincasa hispida* 0.9ml/200g,p.o.

Triton-x (TX) induced hyperlipidemic model: i. Group I – Normal Saline 2ml/kg, p.o, ii. Group II–Single dose of TX-100, 100mg/kg, i.p, iii. Group III–TX 100+Fenofibrate 65mg/kg, p.o, iv. Group IV–TX 100 + Fresh fruit juice of *Benincasa hispida* 0.9ml/200g, oral (p.o) for 7 days.

On 8th day, onwards blood was collected from retro-orbital puncture and serum was centrifuged and analysis serum lipid profile parameters[8].

Atherogenic diet induced hyperlipidemic model: i. Group I – Normal Pellet chow diet, ii. Group II – Atherogenic diet (2% cholesterol, 1% colic acid and 2% arachis oil in addition of normal pellet), iii. Group III–Atherogenic diet + Orlistat 30mg/kg, p.o., iv. Group IV–Atherogenic diet + Fresh fruit juice of *Benincasa hispida* 0.9ml/200g, p.o.

The treatment was continued for 40days, on 41st day the blood was collected and serum was centrifuged and analysis serum lipid profile parameters[9].

Anorectic activity: i. Group I – Normal pellet chow diet, ii. Group II – Normal pellet diet + Sibutramine 5mg/kg, p.o., iii. Group III – Normal pellet diet + Fresh juice of *Benincasa hispida* 0.9ml/200g for 7 days.

Food intakes in grams were measured[10].

Results and discussion

Triton X-(TX)100 induced hyperlipidemia: Reduction the Cholesterol, Triglycerides, LDL and VLDL and increases the HDL level significantly by administration of fresh juice of *Benincasa hispida* at a dose of 0.9ml/200g were compared to that of TX-100 induced hyperlipidemia models showed significant effect as shown in the Table-1 (§§§p<0.0001 and **p<0.001); T X-100 formed the cholesterol, however triton alters the action of lipolytic enzymes from the blood and preventing their removal from blood.

Atherogenic diet induced Obesity: Fresh juice of *Benincasa hispida* at a dose of 0.9ml/200g showed significant effect (§§p<0.001) on body weight reduction when compared with obesity control Table-2, It also showed significant (*p<0.05) reduces Cholesterol, Triglycerides, LDL and VLDL and increased the HDL level as in Standard drug shown in the Table-3.

Anorectic activity: Fresh juice of *Benincasa hispida* at a dose of 0.9ml/200g had significantly (§§p<0.001 and*P<0.05) reduces the food intake 7 days in rats when compared with the standard Sibutramine 5mg/kg as shown in the Table-4 Reason for allaying appetite may be due to the fact that Chylomicrons releases the fatty acids and very low-density lipoproteins (VLDL) in the circulation. Half of the amount was taken for storage. 2-adrenoceptors suppress lipolysis due to catecholamine's and 3-adrenoreceptors, was acting on increase cyclic AMP. In the endothelium vessels found lipoprotein lipase, VLDL are then converted into LDL. Bile acids supported to the formation of hypercholesterolemia while simultaneously deposition and oxidation of LDL is inhibited. Hence the fresh juice produces the Anti Hyperlipidemic activity due to prevent the accumulation of lipids in the blood.

Conclusion

The present studies have thus supported the traditional use of *Benincasa hispida* and have scientifically proved the hypolipidemic and antiobesity activity.

Apart from the actions absence of acute toxicity may also offer a new hope for the safer treatment of diseases, the exact phytoconstituents were extended to identify for further studies, responsible for hypolipidemic and antiobesity action to be observed significant activity for the exact mechanism of action to produces and the result to development for potent hypolipidemic and antiobesity agent with low toxicity and better therapeutic activity.

Table-1: Effect of fresh juice of *Benincasa hispida* on serum lipid profile in Triton X-100 induced hyperlipidemia.

Treatment	Cholesterol (mg/dl)	TG (mg/dl)	HDL (mg/dl)	LDL (mg/dl)	VLDL (mg/dl)
Control (Normal saline 2ml/kg, p.o.)	67.333± 0.843	87.5± 0.764	17.167± 0.601	27.5± 0.764	15.833± 0.60
Lipid control (Triton-X100, 100mg/kg,i.p)	209.667 ± 2.906	194.66± 1.25	10.167± 0.601	48.5 ± 0.992	36.167± 0.792
Standard (Fenofibrate 65mg/kg, p.o.)	72.333 ± 0.843§§§	92.5 ± 0.764§§§	16.5 ± 0.428§§§	19.838± 1.01§§§	19.833± 0.60§§§
Test (Fresh juice of *B.hispida* 0.9ml/ 200g, p.o.)	81.667± 0.667**	106.5± 2.320**	17.833± 0.703§§§	23.333± 1.45§§§	25± 1.592§§§

The Expressed Values are Mean ± Standard Error Mean (n=6 for each group). §§§p<0.0001, **p<0.001 vs. Control by one way ANOVA by Dunnett's Method.

Table-2: Effect of Fresh juice of *Benincasa hispida* on body weight changes in atherogenic diet produces Obesity.

Treatment	Initial weight of the body (g) 1st day	Final weight of the body (g) 41st day
Control (Normal pellet diet)	183 ± 3.8	200 ± 2.9
Atherogenic diet	181 ± 3.2	272 ± 3.3
Standard (Orlistat 30mg/kg, p.o.)	183 ± 2.8*	218 ± 4.4§§
Test (Fresh juice of *B.hispida* 0.9ml/200g, p.o.)	190 ± 1.7*	230 ± 2.3§§

The Expressed Values are Mean ± Standard Error Mean(n=6 for each group), §§p<0.001, *p<0.05 vs. Control by one way ANOVA by Dunnett's method.

Table-3: Effect of Fresh juice of *Benincasa hispida* on serum lipid parameters in Atherogenic diet produces Obesity.

Treatment	Cholesterol (MG/DL)	TG (MG/DL)	HDL (MG/DL)	LDL (MG/DL)	VLDL (MG/DL)
Control (Normal Pellet Diet)	85.16± 1.4	77.33± 2.060	15.5± 0.764	25.83± 1.302	21.5 ± 0.764
Obesity Control (Atherogenic diet)	201.33± 3.844	201.66 ± 3.323	10 ± 0.577	109.5 ± 1.607	44.5 ± 0.764
Standard (Orlistat 30mg/kg, p.o.)	97 ± 2.160§§§	106.83 ± 2.37§§§	29.16 ± 1.014§§§	37.16 ± 0.601§§§	24.83 ± 0.601§§§
Test (Fresh juice of *B.hispida* 0.9ml/200g, p.o.	123.33 ± 1.542*	126 ± 1.390§§§	22 ± 1.571§§§	50.83 ± 2.242§§§	30.5 ± 0.764§§§

The Expressed Values are Mean ± Standard Error Mean (n=6 for each group). §§§p<0.001, *p<0.05 vs. Control by one way ANOVA by Dunnett's method

Table-4: Effect of Fresh juice of *Benincasa hispida* on anorectic activity.

Treatment	Food intake in Days (g)						
	I	II	III	IV	V	VI	VII
Control (Normal Pellet diet)	24.83± 1.19	25.5± 0.764	26.33± 0.888	24.83± 0.601	25.5± 0.764	23.66± 0.211	24.833 ± 0.946
Standard (Sibutramine 5mg/kg, p.o.)	23.5± 0.764§§	22.5± 0.764§§	27.7± 0.765§§	18.5± 0.428§§	14.5± 0.765§§	12.66± 0.489§§	12.16± 0.401§§
Test (Fresh juice of *B.hispida* 0.9ml/ 200g,p.o)	25.16± 0.601*	25± 0.577*	23.83± 0.401*	22.8± 0.365*	17.5± 0.763*	16.16± 0.401*	14.66± 0.667§§

The Expressed values are Mean ± Standard Error mean (n=6 for each group). §§p<0.001, *p<0.05 vs. Control by one way ANOVA by Dunnett's method.

Acknowledgement

We owe our sincere thanks to the Honourable Chairperson Dr. K. Veeramani, M.A., B.L., Periyar Maniammai Institute of Science and Technology (PMIST) and the Principal Dr. R. Senthamarai, M.Pharm., Ph.D., Periyar College of Pharmaceutical Sciences, Tiruchirappalli for providing necessary facilities and infrastructure to do the research work.

References

1. Jain K.S., Kathiravan M.K., Somani R.S. and Shishoo C.J. (2007). The biology and chemistry of hyperlipidemia. *Bioorganic & medicinal chemistry*, 15(14), 4674-4699.

2. Ghule B.V., Ghante M.H., Saoji A.N. and Yeole P.G. (2009). Antihyperlipidemic effect of the methanolic extract from Lagenaria siceraria Stand. fruit in hyperlipidemic rats. *Journal of ethnopharmacology*, 124(2), 333-337.

3. Khar C.P. (2007). Indian Medicinal Plants. *Springer Publications,* 1, 88-89.

4. Miller L.G. (1998). Herbal medicinal: selected clinical considerations focusing on known or potential drug herb interactions. *Arch Intern Med.,* 158, 2200-2211.

5. Winslow L.C. and Kroll D.J. (1998). Herbs as medicines. *Archives of internal medicine*, 158(20), 2192-2199.

6. Lele R.D. (1999). Ayurveda (Ancient Indian System of Medicine) and modern molecular medicine. *Journal of the Association of Physicians India,* 47, 625-628.

7. Reynolds E.H. (2003). Brain and mind: a challenge for WHO. *The Lancet*, 361(9373), 1924-1925.

8. Sudha S.S., Karthic R. and Naveen J.R. (2011). Anti hyperlipidemic activity of Spirulina platensis in Triton X-100 induced hyperlipidemic rats. *Hygeia: J Drugs Med*, 3, 32-37.

9. Sampathkumar M.T., Kadetti R.B., Nabi SA., Renuka Sudarshan P. and Swapna S. (2011). Antihyperlipidemic and antiatherogenic activities of Terminalia pallia linn, fruit in high diet induced hyperlipidemic rats. *Journal of Pharmacy & Bio Allied Sciences,* 3(3), 449-452.

10. Vogel H.G. (2002). Drug discovery and evaluation: pharmacological assays. Springer Science & Business Media.

11. Friedman M. and Byers S.O. (1957). Mechanism underlying hypercholesteremia induced by Triton WR-1339. *American Journal of Physiology-Legacy Content*, 190(3), 439-445.