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Research Article

Antidiabetic Activity and Lipid Profiles in Diabetic Induced Wistar Rats Treated with Plant Extracts and Comparative Studies

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ABSTRACT

Type 2 Diabetes mellitus is a chronic metabolic disorder, characterized by hyperglycemia resulting from defects in insulin secretion, insulin action or both. This investigation was designed to study the antidiabetic activity and lipid profiles was investigated in diabetic induced Wistar rats treated with plant extracts and comparative studies. Diabetes was induced after a single intra peritoneal injection of Alloxan drug (120 mg/ kg). Rats were divided into seven groups with 6 rats in each group: 1. Normal control rats, 2. Diabetic Control rats (Untreated, Alloxanized), 3.Diabetic rats administered with Glybenclamide drug (600µg/kg/bw) as reference standard drug while, 4.Diabetic rats administered with *Hemedesmus indicus* leaf extract (11mg/bw), 5.Diabetic rats administered with Cassia auriculata flower extract (7 mg/bw), 6. Diabetic rats administered with *Chloroxylon swietenia* bark extract (8 mg/bw), 7.Diabetic rats administered with *Tinospora cordifolia* leaf extract (10 mg/bw). The parameters studied were lipid profile like Total cholesterol (TC), Triglyceride (TG), High-density lipoprotein (HDL), Low-density lipoprotein (LDL). The result of test drug was compared with diabetic control. Glibenclamide (600µg/kg/bw) was selected as standard hypoglycaemic drug. Administration of plant extracts shows the antidiabetic activity and reduction in blood glucose level at 7thday. Administration of plant extracts also shows decreased in serum TC, TG,, HDL, LDL in diabetic induced Wistar rats. The results obtained from the present study revealed the potential Antidiabetic activity of selected plant extracts *Hemedesmus indicus, Cassia auriculata, Chloroxylon swietenia* and *Tinospora cordfiolica.*

1. Introduction

Diabetic mellitus (DM) is characteristic by hyperglycemic due to disturbance in the group of metabolisms of carbohydrates, fat and protein, resulting from defects in insulin secretion action or both (Georg et al., 2000). The World Health Organization (WHO) published estimates fo r the years 2000 and 2030, using data from 40 countries but extrapolated to the 191 WHO member states (Shaw et al., 2010). Currently there are over 150 million diabetes worldwide this number is likely to increase 300 million or more by the year 2025 due to increase in sedentary lifestyle, consumption of energy rich diet, and obesity (Yajnik et al ., 2001).This disorder results from relative or absolute deficiency of insulin due to impairment of insulin action and or moderate to gross inadequacy of insulin secretion (Kamtchouing et al., 2006). Hence, diabetes mellitus is characterized by chronic hyper glycemia with glucosuria and a tendency to develop ketoacidosis (Vuksan et al., 2005).In recent times, many medicinal plants continue to provide valuable therapeutic agents for the treatment of both in modern medicine and by the traditional system throughout the world (Mallika Jainu et al., 2006; Janakiramulu et al., 2025).

Though different types of oral hypoglycemic agents are available along with insulin for the treatment of diabetes mellitus, there is a growing interest in herbal remedies due to the side effects associated with these therapeutic agents (Kamesawara et al., 2000). *Hemedesmus indicus* plant has been used traditionally for the treatment of blood disorders, low digestion, anorexia, diarrhea, asthma, fever, cough, itching, and skin diseases including leprosy (Anjaria et al.,2002). Various effects of *Hemidesmus indicus*, such as hypoglycemic (Murshed et al.,2005), hypolipidemic (Bopanna et al.,2005), antioxidant, antithrombotic (Mary et al., 2003; Namthabad et al., 2014), anti-

inflammatory (Lamprontietal., 2008), antiulcerogenic (Anoopetal., 2008), hepatoprotective (Prabakan et al., 2000), Reno protective (Alam et al., 2004), and neutralization of viper venom (Alamet al.,1996) have been reported. Cassia auriculata. It is widely used in ayurvedic medicine as tonic, astringent and as remedy for diabetes, conjunctivitis and ophthalmia (Joshi et al.,2000). The flowers and seeds of Cassia auriculata has been reported to show a very significant antidiabetic effect (Shrotri et al,.1960). It establishes good control of sugar levels in the treatment of diabetes (Shrotri et al.,1961and Shrotri et al.,1968). We have already reported the antiperoxidative effect of aqueous extract of Cassia auriculata flowers in diabetic rats (Jayaprasad et al.,2014; Swapna et al., 2024).

A literature survey showed that the antihyperglycemic activity of Cassia auriculata has been demonstrated by Shrotri et al. in alloxan induced diabetic rabbits (Shrotri et al.,1968). *Chloroxylon swietenia* has been used in the folkloric medicine (Jayaprasad et al.,2014). Tribes apply the leaf paste on wounds, cuts, burns and skin diseases for quick relief (Venkataswam et al., 2010)to treat worm infested wound of animals, fungal infection of skin and rheumatism (Reddy et al.,2007; Lunavath et al., 2013) and used as a Anti diabetic (Aravind Patchimatlaet al.,2014).Tinospora cordifolia the plant is of great interest to researchers across the globe because of its reported medicinal properties like anti-diabetic, anti-periodic, anti-spasmodic, anti-inflammatory, anti-arthritic, anti-oxidant, anti-allergic, anti-stress, anti-leprotic , immunomodulatory and anti-neoplastic activitie (Soham Saha et al.,2012).In diabetic patients, elevated blood lipid levels (HDL,LDL) are also associated with the risk of coronary heart disease, just as they are in the general population(Grundy et al., 1999).Diabetic patients should be managed as a very high risk group for premature atherosclerosis, especially coronary heart disease (Lipmanet al .,1997). Dyslipidemia, also a major risk factor for atherosclerotic disease and, is usually characterized by hypercholesterolemia, hypertriglyceridemia, and low high-density lipoprotein (HDL) cholesterol (Webster et al.,1997; Kumar et al., 2020; Porika et al., 2014). Now we are looking anti-diabetic activity of these four plant extracts and Lipid Profile comparison in diabetic induced rats treated with plant extract and controls.

2. Materials and Methods

2.1. Chemicals

Alloxan monohydrate and Glibenclamide are procured from Sigma, Bangalore. Wellion LUNA duo Glucometer and Blood gluco-strips procured from Med Trust-Glucoworld, Kerala. EDTA; NaCl(0.9% w/v); Phosphate buffer (pH 6.5) 90 mmol/L; Phenol 26 mmol/L;4-Aminoantipyrine 0.4 mmol/L ; Cholesterol Esterase 500U/L; Cholesterol Oxidase500U/L; Peroxidase 1250U/L,Glycerol kinase 1250U/L form Sigma, Bangalore.All reagents are ready for use and stable up to the expiry date given on label when stored at 2–800 C.

2.2 Preparation of Extracts

Each plant powder was successively extracted with different organic solvents in increasing polarity order according to by Soxhlet extraction method (Kemal Duricet al., 2015).By using Soxhlet extractor exhaustive extraction with a series of solvents of increasing polarity was done. Solvents used with increasing polarity are n-Hexane, Chloroform, Ethyl acetate, Acetone and Methanol. For each extraction, 500gr of powdered material was weighed accurately and placed in Soxhlet extraction chamber which was suspended above the flask containing 1000 ml of 80% solvent and below a condenser. The flask was heated and the solvent evaporated and moved into the condenser where it was converted into a liquid that trickled into the extraction chamber containing the plant material. The extraction chamber was designed so that when the solvent surrounding the sample exceeded at certain level it overflowed and trickled back down into the boiling flask. At the end of the extraction process, the flask containing the solvent extract was removed and excess solvent was evaporated by using rotary evaporator. The weight of the residual extract was measured and percent yield was calculated. The residue of the extract was dissolved in 25 ml of pure methanol and stored in air tight glass vials at 400C until further use.

Extract yield % = W1/W2 X 100;

Where, W1 = Net Weight of powder in grams after extraction, W2 = total Weight of powder in grams taken for extraction

2.3 Test Animals:

Adult albino Wistar rats (150-155gr), aged 8-14 weeks older were obtained from Animal house, University college of Pharmaceutical science, Kakatiya University, Warangal and were used in the study rats were acclimatized for a period of 7 days before experimentation, housed in groups of seven polypropylene cages, lined soft wood shaving as bedding (renewed every 24hrs),12/12h light/dark cycles, relative humidity 50-60 and at temperature 22±3°c ,were fed with rat pellet diet (Gold moher, Lipton India Ltd) and water add libitum regular.

2.4 Experimental design

Animals selected were fasted over night and then divided into seven groups (n=6) as follows:

- Group-I: Normal Control rats (non-alloxanized) that was administered with standard feed and water.
- Group-II: Diabetic control rats (Untreated, alloxanized).
- Group III: Diabetic rats administered with Glybenclamide drug (600µg/kg/bw) as reference standard drug while.
- Group-IV: Diabetic rats administered with Hemedesmus indicus leaf extract (11 mg/bw)
- Group-V: Diabetic rats administered with Cassia auriculata leaf extract (7 mg/bw)
- Group-VI: Diabetic rats administered with Chloroxylon swietenia bark extract (8 mg/bw)
- Group-VII: Diabetic rats administered with Tinospora cordifolia leaf extract (10 mg/bw)

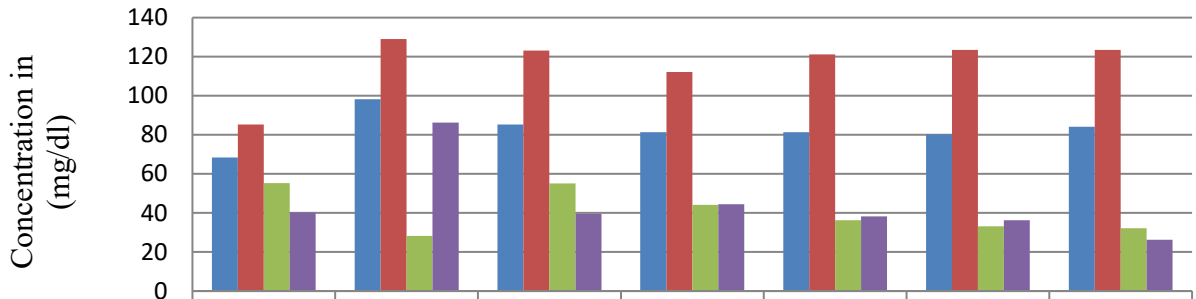
2.5 Induction of experimental diabetes

Diabetes was induced by intra peritoneal injection (single dose) of alloxan monohydrate (120 mg kg-1b.w.) in 0.9% w/v NaCl solution (normal saline) to overnight fasted normal rats. Blood glucose level was checked by using one-touch glucometer and diabetes was confirmed after 72 hr of alloxanisation. Rats shown FBG > 250 mg/dl were considered to be diabetic and were selected for studies.Treatment was continued for a period of 7 days following oral administration to the experimental animals by gastric intubation, using a force-feeding needle.

2.6 Specimen Collection and Preparation

Serum samples and EDTA, free from hemolysis, are the specimens. Serum from blood cells were Separated. Sample

Fig 1. Lipid Profile comparison in diabetic induced rats treated with plant extract and controls



	NC	DC	SC	Hemedesmus indicus	Chloroxylon swetania	Casia auriculata	Tinospora cordfiolica
Total Cholesterol	68.4	98.2	85.2	81.3	81.3	80.2	84.2
Triglycerides	85.2	129	123.2	112.1	121.1	123.4	123.4
HDL	55.2	28.2	55.1	44.2	36.2	33.2	32.2
LDL	40.2	86.2	39.5	44.5	38.2	36.2	26.2

Storage and Stability of Total cholesterol in serum stable for at least 7 days when stored at 2 - 8°C, up to 3 months when stored at ≤ -20°C and at -70°C (Tietz et al., 1990). The estimation of cholesterol, Triglyceride, HDL, LDL in serum was performed at 0 day and at 7th day after completes of the treatment respectively all groups of animals.

Estimation of Serum Lipids by CHOD-PAP-Phosphotungstate method: In-vitro quantitative determination of the activity of cholesterol, Triglyceride, HDL, LDL in serum was estimated by CHOD-PAP method (Richmond et al.,1973, Henry et al., 1974, Charles et al., 1974).

3. Results and Discussion

This shows the Lipid profile comparison in Diabetic induced rats treated with Plant extract and Controls.

Total Cholesterol: The Normal control group rats have 68.4mg/dl, Diabetic control group rats have 98.2mg/dl, standard control group rats have 85.2mg/dl and Hemedesmus indicus leaf extract treated group rats have 81.3mg/dl, Chloroxylon swietenia bark extract treated group rats have 81.3mg/dl, Cassia auriculata flower extract treated group rats have 80.2mg/dl and *Tinospora cordfiolica* leaf extract treated group rats have 84.2mg/dl.

Triglycerides: The Normal control group rats have 85.2mg/dl, Diabetic control group rats have 129mg/dl, standard control group rats have 123.2mg/dl, *Hemedesmus indicus* leaf extract treated group rats have 121.1mg/dl, *Chloroxylon swietenia* bark extract treated group rats have 121.1mg/dl, Cassia auriculata flower extract treated group rats have 123.4mg/dl and *Tinospora cordfiolica* leaf extract treated group rats have 113.4 mg/dl.

HDL: The Normal control group rats have 55.2mg/dl, Diabetic control group rats have 28.2mg/dl, standard control group rats have 55.1mg/dl, *Hemedesmus indicus* leaf extract treated group rats have 42.2 mg/dl, Chloroxylon swietenia bark extract treated group rats have 36.2 mg/dl, Cassia auriculata flower extract treated group rats have 33.2 mg/dl and *Tinospora cordfiolica* leaf extract treated group rats have 32.2mg/dl.

LDH: The Normal Control group rats have 40.2mg/dl, Diabetic control group rats have 86.2mg/dl, Standard control group rats have 39.4 mg/dl, *Hemedesmus indicus* leaf extract treated group rats have 44.2 mg/dl, *Chloroxylon swietenia* bark extract treated group rats have 38.2 mg/dl, Cassia auriculata flower extract treated group rats have 36.2mg/dl and *Tinospora cordfiolica* leaf extract treated group rats have 26.2 mg/dl.

Table 1. Effect of *Hemedesmus indicus* leaf extract on Lipid profile of Wistar rats

	Total cholesterol (mg/dl)	**TGL (mg/dl)**	**HDL (mg/dl)**	**LDL (mg/dl)**
Group I (NC)	68.4±4.02	85.2±6.02	55.2±0.48	40.2±1.01
Group II (DC)	98.2±1.6	129±1.58	28.2±0.78	86.2±2.0
Group III(sc)	85.2±1.12	123.2±1.52	55.1±1.67	39.4±3.12
Group IV *Hemedesmu sindicus*(11 mg/bw)	81.3±1.18	112.1±2.01	44.2±1.31	44.2±2.12

Table 2. Effect of *Chloroxylon swetania* bark extract on lipid profile of Wistar rats

	Total cholesterol (mg/dl)	TRG (mg/dl)	HDL (mg/dl)	LDL (mg/dl)
Group I (NC)	68.4±4.02	85.2±6.02	55.2±0.48	40.2±1.01
Group II(DC)	98.2±1.6	129±1.58	28.2±0.78	86.2±2.0
Group III (Sc)	85.2±1.12	123.2±1.52	55.1±1.67	39.4±3.12
Group V *Chloroxylon swetania* (8mg/bw)	81.3±1.14	121.1±1.48	36.2±0.41	38.2±0.15

Fig 2. Effect of *Hemedesmus indicus* leaf extract on Lipid profile of Wistar rats

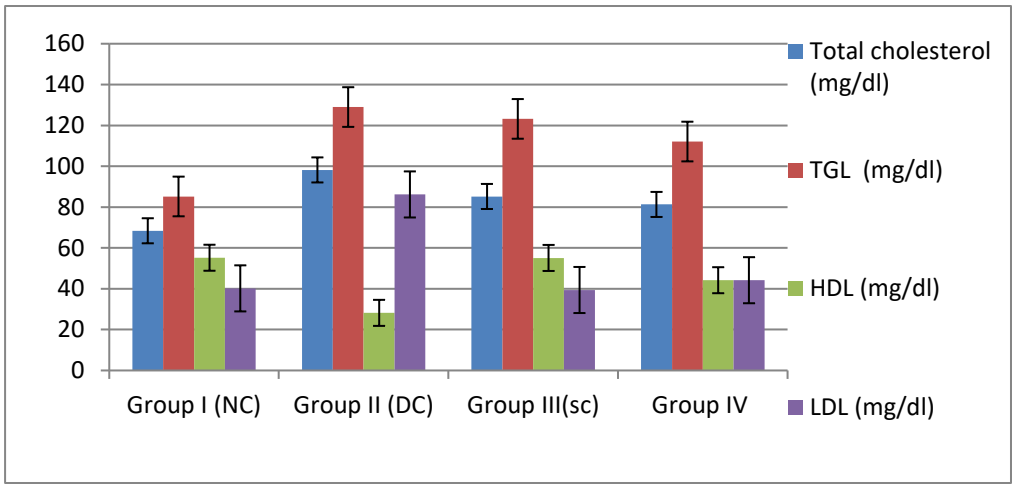


Fig 3. Effect of *Chloroxylon swetania bark* extract on lipid profile of wistar rats

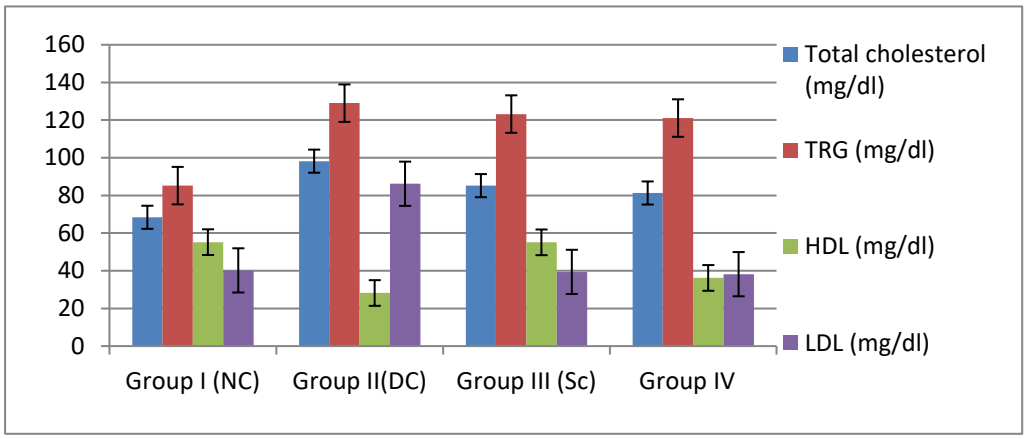


Fig 4. Effect of *Casia auriculata* flower extract on lipid profile of wistar rats

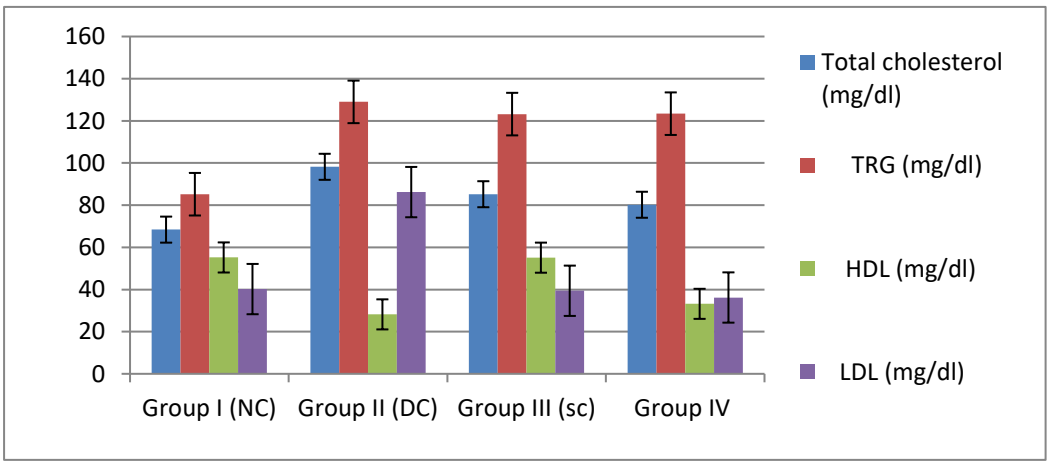


Figure-3 shown the effect of *Chloroxylon swietenia* bark extract on lipid profile of Wistar rats. Here the Total cholesterol 17.21% was decreased when compare to the diabetic control group rats. The triglycerides 6.13% was decreased with compare to the diabetic control group rats. HDL 28.36% was increased when compare to the diabetic control group rats and LDL 44.31% was decreased when compare to the diabetic control group rats.

Figure-4 shows the effect of *Cassia auriculata* flower extract on lipid profile of Wistar rats. Here the Total cholesterol 18.33% was decreased with compare to the diabetic control group rats. The triglycerides 4.35% was decreased with compare to the diabetic control group rats. HDL 17.73% was increased with compare to the diabetic control group rats and LDL 41.99% was decreased with compare to the diabetic control group rats.

Fig 5. Effect of *Tinospora cordfiolia* leaf extract on lipid profile of Wistar rats

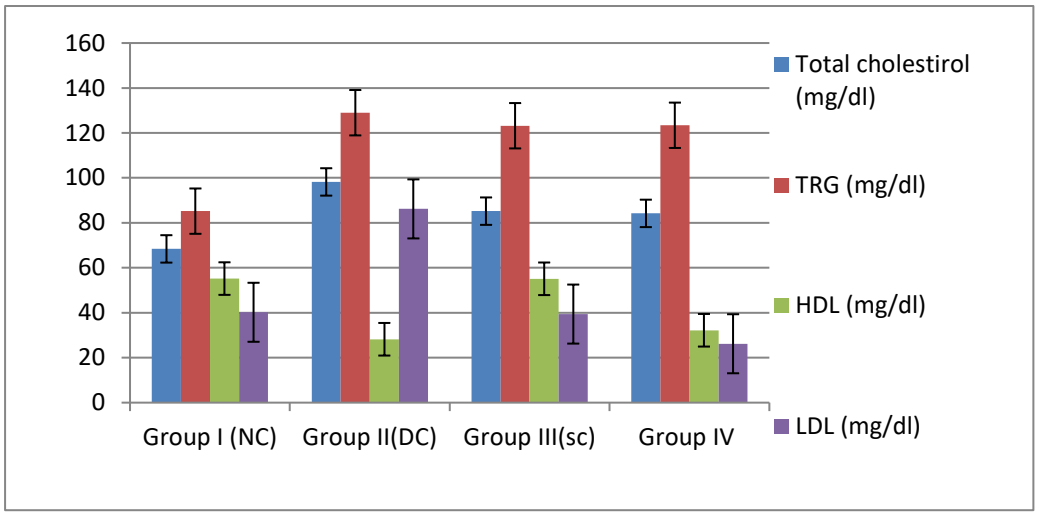


Figure-5 shows the effect of *Tinospora cordfiolica* leaf extract on lipid profile of wistar rats. Here the Total cholesterol 14.26% was decreased with compare to the diabetic control group rats. The triglycerides 4.35% was decreased with compare to the diabetic control group rats. HDL 14.18% was increased with compare to the diabetic control group rats and LDL 30.16% was decreased with compare to the diabetic control group rats. The induction of diabetes is confirmed by elevated levels of fasting blood glucose levels in selected rats.

Table 3. Effect of *Casia auriculata* flower extract on lipid profile of wistar rats

	Total cholesterol (mg/dl)	**TGL (mg/dl)**	**HDL (mg/dl)**	**LDL (mg/dl)**
Group I (NC)	68.4±4.02	85.2±6.02	55.2±0.48	40.2±1.01
Group II (DC)	98.2±1.6	129±1.58	28.2±0.78	86.2±2.0
Group III(sc)	85.2±1.12	123.2±1.52	55.1±1.67	39.4±3.12
Group IV *Casia auriculata (7mg/bw)*	80.2±1.2	123.4±1.51	33.2±1.42	36.2±2.98

Table 4. Effect of *Tinospora cordfiolica* leaf extract on lipid profile of wistar rats

	Total cholesterol (mg/dl)	**TGL (mg/dl)**	**HDL (mg/dl)**	**LDL (mg/dl)**
Group I (NC)	68.4±4.02	85.2±6.02	55.2±0.48	40.2±1.01
Group II (DC)	98.2±1.6	129±1.58	28.2±0.78	86.2±2.0
Group III(sc)	85.2±1.12	123.2±1.52	55.1±1.67	39.4±3.12
Group IV *Tinospora cordfiolica 10mg/bw))*	84.2±1.13	123.4±1.51	32.2±1.01	26.2±2.02

The present study was focused to explore the selected plant extracts *Hemedesmus indicus, Cassia auriculata, Chloroxylon swietenia, Tinospora cordifolia*. The results of present study indicate that decreasing fating blood glucose levels achieved by multiple dose study in different groups in sub-acute studies indicates the effectiveness of extract in Alloxan induced diabetic rats.

The precise mechanism of alloxan-induced diabetes remains unclear, there is increasing evidence that it involves the degeneration of islet-cells by accumulation of cytotoxic free radicals (Halliwell et al.,1989). Considering this, plant extracts was administered daily for 7 days, the period which may be produced a significant reduction in all the diabetic markers, and this effect was more potent as compared to acute dosing. The elevated levels of blood glucose are accompanied with the increases in TC, TG, LDL and fall of HDL levels. Considerable research has been shown that abnormal lipid metabolism is an important predictor for diabetes mellitus (Shukla et al., 1995). The administration of plant extracts showed significant reduction in serum levels of TC, LDL, TG, whereas a significant elevation in HDL levels. The 7-day treatment with extract restored all the above-mentioned parameters towards the normal levels. The administration of plant extracts to diabetic rats showed significant decrease in the levels of blood glucose and an increase in serum insulin levels. Treatment with plant extracts for 7 days significantly augmented the activity of catalase in diabetic rats which could be attributed to the strong antidiabetic property of plant extracts.

4. Conclusion

In the present study the administration selected plant extracts *Hemedesmus indicus, Cassia auriculata, Chloroxylon swietenia, Tinospora cordifolia* showed permanent reduction in blood glucose level, normalization of lipid profile compared with diabetic control therefore it can be concluded that selected plant extract *Hemedesmus indicus, Cassia auriculata, Chloroxylon swietenia, Tinospora cordifolia* shows remarkable effects against Alloxan induced diabetes in Wistar rats.

Competing interests:

The authors declare that they have no competing interests

References

[1] A.Anoop and M. Jegadeesan, "Biochemical studies on the anti-ulcerogenic potential of Hemidesmus indicus R.Br. var.indicus," Journal of Ethnopharmacology, vol. 84, no. 2-3, pp.149–156, 2003.

[2] Anjaria, M. Parabia, G. Bhatt, and R. Khamar, Nature Heals, a Glossary of Selected Indigenous Medicinal Plants of India,SRISTI Innovations, Ahmedabad, India, 2002

[3] Anticoagulant activity of some Artemisia dracunculus leaf extracts. Bosn J Basic Med Sci. 2015;15(2):9-14.

[4] Aravind Patchimatla, Sainath Reddy Kankanala, Sharavanabhava Sheshagiri Bandaru, Umasankar Kulindaivelu, Venkateshwar Rao Jupally, Venkateshwarlu Eggadi. Investigation of lipid profile and ocular oxidative stress of Chloroxylon swietenia on Streptozotocin nicotinamide induced diabetic rats. International Journal of Green Pharmacy. 2014;8:90-6.

[5] B. Jayaprasad, P.S. Sharavanan and K. Karthik: Chloroxylon swietenia an iucn red listed plant – medicinal uses; ijreb,vol. 2 (issue 6) page 213, 2014.

[6] Brahmachari HB, Augusti KT: Hypoglycaemic agents from indigenous plants. J Pharm Pharmacol 13: 381, 1961

[7] Charles C. Allain, Lucy S. Poon,1 Cicely S. G. Chan,1 W. Richmond, and Paul C. Fu; Enzymatic Determinationof Total Serum Cholesterol, CLIN. CHEM. 20/4, 470-475;1974

[8] Georg P, Ludvik B. Lipids and Diabetes. J Clin Basic Cardiol 2000; 3: 159-162.

[9] Grundy, S. M., Benjamin, I. J., Burke, G. L., Chait, A., Eckel, R. H., Howard, B. V., Mitch, W., Smith, S. C. & Sowers, J. R. (1999) Diabetes and Cardiovascular Disease. A statement for healthcare professionals from the American Heart Association. Circulation 100: 1134–1146

[10] Halliwell B, Gutteridge JMC. Free radicals in Biology and Medicine. 2nd Ed. Oxford: Clarendon Press; 1989

[11] Henry, RJ: Clinical Chemistry: Principles and Techniques. Harper & Row, Hagerstown, MD. 1974

[12] I.Lampronti, M. T. H. Khan, M. Borgatti, N. Bianchi, and R. Gambari, "Inhibitory effects of Bangladeshi medicinal plantextracts on interactions between transcription factors and target DNA sequences," Evidence-Based Complementary andAlternative Medicine, vol. 5, no. 3, pp. 303–312, 2008.

[13] Janakiramulu, P., & Mamidala, E. (2025). Molecular Docking and dynamic simulation analysis of flavonoid derivatives as COX-2 inhibitors. *In Silico Pharmacology*, *13*(2), 59.

[14] Joshi SG:Ceasalpinaceae. Textbook of Medicinal Plants. Oxford and IBH Publishing, 2000, p 119

[15] K. N. Bopanna, N. Bhagyalakshmi, S. P. Rathod,R.Balaraman, and J. Kannan, "Cell culture derived Hemidesmus indicusin the prevention of hypercholesterolemia in normal and hyperlipidemic rats," Indian Journal of Pharmacology, vol. 29,no. 2, pp. 105–109, 1997.

[16] Kamesawara, B.R., Giri, R., Kesavulu, M.M., Apparao, C.H., 2000. Effect of oral administration of bark extracts of Pterocarpus santalinus L. on blood glucose level in experimental animals. Journal of Ethnopharmacology 74, 69–74.

[17] Kemal Duric, Elvira E. Kovac-Besovic, Haris Niksic, Samija Muratovic, Emin Sofic.

[18] Kumar, M. P., Mamidala, E., Al-Ghanim, K., Al-Misned, F., Ahmed, Z., & Mahboob, S. (2020). Effects of D-Limonene on aldose reductase and protein glycation in diabetic rats. Journal of King Saud University-Science, 32(3), 1953-1958.

[19] Lipman TH, Hayman LL, Fabian CE. Risk factors for cardiovascular disease in children with type 1 diabetes: part 1. J Pediatr Nurs. 1997:12:265–272.

[20] Lunavath, V., & Mamidala, E. (2013). Preliminary phytochemical screening and antibacterial studies of the leaves of Eclipta alba (L). *Int J Pharma Biosci*, *4*, 380-4.

[21] M. Prabakan, R. Anandan, and T. Devaki, "Protective effect of Hemidesmus indicus against rifampicin and isoniazid-induced hepatotoxicity in rats," Fitoterapia, vol. 71, no. 1, pp. 55–59,2000.

[22] M. S. Kotnis, P. Patel, S. N. Menon, and R. T. Sane, "Renoprotective effect of Hemidesmus indicus, a herbal drug used in gentamicin-induced renal toxicity," Nephrology, vol. 9, no. 3, pp. 142–152, 2004.

[23] M.I.Alam, B. Auddy, and A. Gomes, "Viper venom neutralization by Indian medicinal plant (Hemidesmus indicus andPluchea indica) root extracts," Phytotherapy Research, vol. 10,no. 1, pp. 58–61, 1996.

[24] Mallika Jainu, K. Vijai Mohan, C.S. Shyamala Devi; Protective effect of Cissus quadrangularis on neutrophil mediated tissue injury induced by aspirin in ratsJournal of Ethnopharmacology 104 ,2006, 302–305

[25] N. K. Mary, C. R. Achuthan, B. H. Babu, and J. Padikkala, "In vitro antioxidant and antithrombotic activity of Hemidesmusindicus (L) R.Br," Journal of Ethnopharmacology, vol. 87, no.2-3, pp. 187–191, 2003.

[26] N.S.BIO-TEC; CHOLESTEROL (CHOD-PAP), Enzymatic Colorimetric Determination of Serum Cholesterol; Rev.4-2011

[27] Namthabad, S., & Mamidala, E. (2014). Molecular docking of HIV-1 protease using alkaloids from tinospora cordifolia. *Int J Res Appl*, *1*(1), 12-6.

[28] Nyholm B, Porksen N, Juhl CB, Gravholt CH, Butler PC, Weeke J, Veldhuis S, Pincus S, Schimtz O. Assessment of insulin secretion in relatives of patients with type2 (non-insulin-dependent) diabetes mellitus: evidence of early beta-cell dysfunction. Metabolism 2000; 49: 896-905.

[29] P.Kamtchouing , S.M. Kahpui, P.-D. Djomeni Dzeufiet, L. Tédong,E.A. Asongalem, T. Dimo. Anti-diabetic activity of methanol/methylene chloride stem bark extracts of Terminalia superba and Canarium schweinfurthii on streptozotocin-induced diabetic rats Volume 104, Issue 3, 6 April 2006, Pages 306–309

[30] Pari L, Latha M: Antidiabetic effect of Cassia auriculata flowers: Effect on lipid peroxidation in streptozotocin diabetes rats. Pharm Biol 2002 (in press)

[31] Porika, R., Poojari, S., Lunavath, V., & Mamidala, E. (2014). Preliminary phytochemical investigation and TLC analysis of P. angulata fruit extract. Journal of Pharmacy and Biological Sciences, 9(2), 11-14.

[32] Reddy, C.S., Reddy, K.N., Rao, K.T. and Pattanaik, C., 2007. Ethnobotanical Studies on Medicinal Plants Used by the Chenchus of Nallamalais in Kurnool District, Andhra Pradesh, India. Research Journal of Medicinal Plant. 1: 128-133.

[33] S.Murshed, B. Rokeya, N. Nahar, et al., "Hypoglycemic and hypolipidemic effect of Hemidesmus indicus root on diabetic model rats," Diabetes Research, vol. 39, pp. 15–23, 2005.

[34] Shaw JE, Sicree RA, Zimmet PZ. Global estimates of the prevalence of diabetes for 2010 and 2030. Diabetes Res Clin Pract 2010;87:4-14.

[35] Shrotri DS, Aiman R: The relationship of the post-absorptive state to the hypoglyceamic action. Indian J Med Res 48: 162–168, 1960

[36] Shrotri DS, Meena Kelkar, Deshmukh VK, Aiman R: Investigations of the hypoglycaemic properties of Vinca rosea, Cassia auriculata and Eugenia jambolana. Indian J Med Res 51: 464–467, 1963
[37] Shukla R, Anand K, Prabhu KM, Murthy PS. Hypolipidemic effect of water extracts of Ficus bengalensis in alloxoaninduced diabetes mellitusin rabbits. Indian J Clin Biochem 1995.
[38] Soham Saha and Shyamasree Ghosh, Tinospora cordifolia: One plant, many roles, Anc Sci Life. 2012 Apr-Jun; 31(4): 151–159.
[39] Swapna, K., Srujana, M., & Mamidala, E. (2024). Identification of steroidal cardenolides from Calotropis procera as novel HIV-1 PR inhibitors: A molecular docking & molecular dynamics simulation study. *The Indian journal of medical research*, *160*(1), 78.
[40] Tietz, N.W.(ed), Clinical Guide to Laboratory Tests, 2nd Edition, W.B. Saunders, 1990.
[41] Venkataswam, R., Mohamad M.H., Doss, A., Ravi, T.K., and Sukumar, M. 2010. Ethnobotanical Study of Medicinal plants used by Malasar tribals in Coimbatore District of Tamil Nadu (South India). Asian J Exp Biol Sci. 1(2), 387.
[42] Vuksan and Sievenpiper, Herbal remedies in the management of diabetes: Lessons learned from the study of ginseng,2005Nutrition, Metabolism and Cardiovascular Diseases,Volume 15, Issue 3, June 2005, Pages 149–160
[43] W. Richmond; Preparation and Properties of a Cholesterol Oxidase from Nocardia sp. and Its Application to the Enzymatic Assay of Total Cholesterol in Serum; CLIN. CHEM. 19/12, 1350-1356 ;1973
[44] Webster MW, Scott RS. What cardiologists need to know about diabetes? Lancet. 1997; 350(suppl 1):23–28.
[45] Yajnik CS. The insulin resistance epidemic in India: fetal origins, later lifestyle, or both? Nutr Rev 2001; 59:1-9

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