*HYPOGLYCAEMIC EFFECTS OF SOME LESSER KNOWN DRUGS**

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Introduction

Prevention of diabetes still lies in the future and until then, tens of millions will continue to suffer from the disease.

In the present study effort has been made to determine the hypoglycaemic activity of Abroma Augusta ∅, Syzygium Jambolanum ∅, Cephalandra Indica ∅ and Absinthium D1 Resina Laricis D3 (Weleda) in alloxan induced diabetes in albino rats. The experiments were conducted at Drug Standardisation Unit of the Central Council for Research in Homoeopathy.

Materials & Methods

Albino rats of either sex weighing 240 ± 12 gms. were selected after acclimatising for 15 days to standard laboratory conditions for 15 days. Water was allowed ad libitum. Photo period L/D was also maintained. The acclimatised animals were subjected to qualitative analysis of urine sugar with Benedict's solution and quantitative analysis of blood sugar with Folin & Wu method by taking 0.05 ml. blood from tail vein or through cardiac puncture.

Those animals whose urine sugar was nil and blood sugar level within the range of 80 to 120 mg. were selected for inducing alloxan treated diabetes experimentally. For inducing diabetes in albino rats intraperitonial injections of 10 to 12 mg./ 100 gm. b.w. of alloxan dissolved in distilled water were administered in every animal having 12 hours fasting in order to avoid mortality. Qualitative and quantitative analysis of urine and blood sugar estimations were done to indicate the establishment of diabetes mellitus. The diabetic animals were divided into 6 groups for in vivo and in vitro studies with different drugs. The short term experiment was performed with different doses viz. 25 μ ml., 50 μ ml., 75 μ ml., 0.1 ml., 0.2 ml./ 100 gm. b.w. of Abroma Augusta ∅, Syzygium Jambolanum ∅, Cephalandra indica ∅ and Absinthium D1/Resina Laricis D3. The route of administration of drugs were both oral/IP daily for 21 days. Vehicle fed control (% of alcohol is based on alcohol content of correspondent drug) and 0.9% physiological saline control were maintained to evaluate the drug efficacy with corresponding control and normal control groups. The diabetised animals were divided into following groups of 5 animals each:

Group 1	Control Sup group i	Received 0.1 ml./100 gm. b.w. of 90% alcohol daily for 21 days through oral/1P route.
	Sub Group ii	Received 0.1 ml./100 gm. b.w. of 60% alcohol daily for 21 days through oral/1P route.
	Sub Group iii	Received 0.1 ml./100 gm. b.w. of 46% alcohol daily for 21 days through oral/1P route.
	Sub Group iv	Received 0.1. ml./100 gm. b.w. of 41% alcohol daily for 21 days through oral/1P route.
Group 2	Normal Control	Received 0.1 ml./100 gm. b.w. of 0.9% physiological saline daily for 21 days through oral/1P route.
Group 3	Absinthium D1/ Resina laricis D3	Received 25 μ ml., 50 μ ml., 75 μ ml., 0.1 ml./100 gm. b.w. daily for 21 days subsequently through oral/1P route.

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Group 4	Cephalandra Indica ∅	Received 25 μ ml., 50 μ ml., 75 μ ml., 0.1 ml./100 gm. daily for 21 days subsequently through oral/1P route.
Group 5	Abroma Augusta ∅	Received 25 μ ml., 50 μ ml., 75 μ ml., 0.1 ml./100 gm. daily for 21 days subsequently through oral/1P route.
Group 6	Syzygium Jamb ∅	Received 25 μ ml., 50 μ ml., 75 μ ml., 0.1 ml./100 gm. daily for 21 days subsequently through oral/1P route.

Control Group 1, 2, 3 & 4 were administered 90%, 60%, 46% and 41% alcohol based upon the alcohol content of the drugs Syzygium ∅, Absinthium D1/Resina Laricis D3, Abroma Augusta ∅ and Cephalandra Indica ∅ respectively. Normal control was administered 0.9% physiological saline. Results are shown in Table-1.

TABLE-I

HYPOGLYCAEMIC ACTIVITIES OF HOMOEOPATHIC DRUGS (MEAN ± S.D.)

Sl. No.	Drug/ Vehicle/ Saline	Initial Blood sugar of Diabetised rats in mg. Fasting 2 hrs. PP	Doses of drug per 100 gm. b.w.	BLOOD SUGAR 5th day Fasting 2 hrs. PP	7th day Fasting 2 hrs. PP	14th day Fasting 2 hrs. PP	21st day Fasting 2 hrs. PP
1.	90% Alcohol control for Syzygium Jambolanum ∅	237 250 ±2.25 ±1.25	25μ ml.	160 200 ±2.00 ±1.5	178 212 ±1.2 ±4.5	187 218 ±2.2 ±3.1 1D	232 270 ±1.2 ±2.5 2D
2.	60% Alcohol control for Absinthium & Resina	250 275 ±2.12 ±1.4	-do-	177.5 203.7 ±2.1 ±2.2	181.2 227.5 ±4.5 ±5.0	201.85 238.75 ±2.4 ±3.5	212.5 247.00 ±2.7 ±2.2
3.	46% Alcohol control for Abroma Augusta ∅	220 243 ±2.2 ±2.4	-do-	152.0 177.0 ±1.4 ±2.6	170 202 ±2.3 ±2.4	176 197 ±2.4 ±2.5	177 220 ±2.6 ±4.2
4.	41% Alcohol control for Cephalandra Indica ∅	240 253 ±3.2 ±2.2	-do-	158 187 ±2.0 ±1.4	186 213 ±2.2 ±1.1	202 230 ±4.4 ±2.1	206 241 ±2.0 ±2.6
5.	0.9% Saline Normal Control	236 256 ±2.2 ±2.4	-do-	185 213 ±2.7 ±2.0	201 230 ±2.5 ±4.4	240 277 ±2.0 ±4.4	255 280 ±3.2 ±4.4

The results of Syzygium Jambolanum, Absinthium and Resina Laricis, Abroma Augusta and Cephalandra Indica are indicated in Table-II.

TABLE-II

Sl. No.	Name of the drug	Initial Blood Sugar Fasting/PP	Doses of drug per 100 gm. b.w.	BLOOD SUGAR 5th day Fasting 2 hrs. PP	7th day Fasting 2 hrs. PP	14th day Fasting 2 hrs. PP	21st day Fasting 2 hrs. PP
1.	Syzygium Jambolanum ∅	230 250 ±2.2 ±1.1	25μ ml.	146 282 ±2.2 ±3.4	177 112 ±2.2 ±1.1	230 273 ±2.2 ±2.3	202 237 ±2.2 ±2.2
		207 240 ±2.4 ±3.4	50μ ml.	230 285 ±3.5 ±3.2	295 320 ±2.1 ±1.2	255 290 ±4.4 ±2.9 1D	255 290 ±2.6 ±2.1 1D
		235 260 ±2.3 ±3.5	75 μ ml.	250 275 ±4.4 ±4.6	275 315 ±2.2 ±1.3	250 300 ±4.7 ±2.7	225 255 ±2.2 ±1.4 1D 1D
		235 257 ±2.2 ±2.9	0.1 ml.	165 195 ±3.2 ±3.0	235 265 ±3.1 ±1.4	200 235 ±5.2 ±2.2 2D	155 195 ±1.0 ±1.6 1D
2.	Absinthium and Resina Laricis	210 237 ±1.2 ±2.4	25 μ ml.	160 192 ±3.5 ±2.2	157 175 ±2.2 ±1.2	130 150 ±1.1 ±2.3	125 130 ±1.1 ±2.2
		435 460 ±1.4 ±7.2	50μ ml.	305 342 ±2.2 ±4.2	285 315 ±3.2 ±2.4	260 288 ±1.4 ±2.2	205 235 ±1.0 ±2.3
		450 480 ±1.4 ±5.7	75 μ ml.	185 215 ±3.2 ±5.2	170 210 ±2.6 ±4.4	160 195 ±2.6 ±2.4	127 155 ±2.1 ±2.2
		440 350 ±3.2 ±4.5	0.1 ml.	215 250 ±2.2 ±4.1	240 200 ±3.2 ±2.4	227 245 ±2.7 ±2.1	245 230 ±2.6 ±2.3
3.	Abroma Augusta ∅	240 266 ±2.2 ±2.7	25 μ ml.	150 182 ±2.2 ±2.2	151 182 ±2.5 ±0.5	165 201 ±2.2 ±2.7	152 188 ±2.8 ±2.2
		215 265 ±1.4 ±2.6	50 μ ml.	315 345 ±2.4 ±2.3	360 305 ±2.2 ±1.2	300 332 ±2.3 ±2.5	275 305 ±3.8 ±2.2
		172 192 ±1.5 ±1.2	75 μ ml.	275 242 ±2.3 ±2.7	275 335 ±2.2 ±1.2	275 305 ±2.2 ±2.2	232 265 ±2.2 ±2.9
		215 245 ±1.7 ±1.6	0.1 ml.	165 197 ±2.6 ±2.7	235 262 ±1.1 ±1.2	250 285 ±2.4 ±2.0	190 215 ±3.2 ±2.4
4.	Cephalandra Indica ∅	222 240 ±2.2 ±2.4	25 μ ml.	140 170 ±1.2 ±1.7	131 160 ±2.4 ±2.2	116 142 ±2.2 ±2.2	95 130 ±1.2 ±1.4
		235 255 ±2.3 ±2.2	50 μ ml.	270 325 ±1.2 ±1.8	272 305 ±3.4 ±3.4	245 272 ±2.2 ±2.1	200 228 ±2.5 ±2.2

	202 225 ±2.6 ±2.1	75 μ ml.	250 208 ±1.4 ±1.9	235 267 ±2.2 ±2.4	200 245 ±2.4 ±1.2	155 160 ±2.7 ±5.5
	232 275 ±2.1 ±2.0	0.1 ml.	180 225 ±1.5 ±2.3	160 205 ±2.6 ±3.5	145 160 ±1.4 ±1.1	120 140 ±2.5 ±1.5

Table-III gives stabilisation of blood sugar level in controls.

TABLE-III

Sl. No.	Drug/Vehicle/ Saline	Route of drug admn.	Days at which Blood Sugar level comes to normal	Effective doses per 100 gm. b.w.	Duration of stabilisation of blood sugar level after withdrawal of drug mean value	Percentage of stabilisation after ED 50 and ED 100 analysis
1.	90% Alcohol fed control for Syzygium	Oral/I.P	Exhibited Hyperglycaemic action	Not effective tried 250 μ ml. to 0.1 ml.	Never attained normal level Mortality is common	Nil
2.	60% Alcohol fed control for Absinthium and Resina Laricis	-do-	-do-	None	Never attained normal level	Nil
3.	46% Alcohol control for Abroma Augusta	-do-	-do-	None	-do-	Nil
4.	41% Alcohol fed control for Cephalandra Indica	-do-	-do-	None	-do-	Nil
5.	0.9% Physiological Saline	-do-	-do-	None	-do-	Nil

TABLE-IV

HYPOGLYCAEMIC ACTIVITIES OF HOMOEOPATHIC DRUGS

STABILISATION OF BLOOD SUGAR LEVEL AFTER WITHDRAWAL OF DRUG IN ALBINO RATS

Sl. No.	Drug/Vehicle/ Saline	Route of drug admn.	Days at which Blood Sugar level comes to normal	Effective doses per 100 gm. b.w.	Duration of stabilisation of blood sugar level after withdrawal of drug mean value	Percentage of stabilisation after ED 50 and ED 100 analysis
1.	Syzygium Jambolanum Ø	Oral/I.P	Exhibited hypoglycaemic action but toxicity & Mortality prominent at dose level of 50 μ ml./ 100 gm. b.w. and above	None was effective tried 25 Ø ml. to 0.1 ml.	Never attained normal level mortality is common	Nil
2.	Absinthium and Resina Laricis	-do-	Attained Normal level usually between 12th to 17th days at a dose level of 25 μ ml. to 75 μ ml./100 gm. b.w. depending on blood sugar level	Effective doses 25 μ ml. to 75 μ ml. But 25 μ ml. is most effective	10-12 days No toxicity 10-15 days No Toxicity	60% (in case of 21 days regular admn. of drug)
3.	Abroma Augusta Ø	-do-	Attained Normal level after 20 to 25 days regular administration of drug	Mild Hypoglycaemic effect 50 μ ml. to 0.1 ml.	Does not stabilise the blood sugar level but rise in blood sugar is slow after withdrawal of drug	Nil
4.	Cephalandra Indica Ø	Oral/I.P.	Attained Normal level usually after 15th to 75 μ ml./ 100 gm. b.w. depending on blood sugar level	Effective doses are 25 μ ml. to 75 μ ml. But 25 μ ml. is most effective	14 to 20 days (in 21 days regular admn. of drug) No toxicity appeared. 20 to 25 days (30 days regular admn. of drug) No toxicity appeared.	70% 70%

Table-IV gives the stabilisation of blood sugar of 4 drugs. It is seen that Syzygium Jambolanum Ø exhibited hypoglycaemic action but toxicity and mortality was prominent at a dose level of 50 μ ml. 100 gm. b.w. and above and stabilisation was never obtained. Blood sugar level under Absinthium D1/ Resina Laricis D3 attained

normal level between 12th to 17th days at a dose level of 25 μ ml. to 75 μ ml./100 gm. b.w. Duration of stabilisation of drug was 10-15 days after withdrawal of drug.

Blood sugar level under Abroma Augusta obtained normal level after 20 to 25 days of regular administration of drug at a dose level of 50 μ ml./100 gm. b.w. But this starts rising slowly after withdrawal of the drug.

Under Cephalandra Indica normal blood sugar level was obtained usually after the 15th day of regular drug administration and this level remains stabilised at that level after withdrawal of the drug for 14 to 20 days at a dose level of 25 μ ml. to 50 μ ml./100 gm. b.w.. Thus best results have been shown under this drug.

Conclusion

The experimental studies revealed that regular administration of drug Cephalandra Indica ∅ and Absinthium D1 Resina Laricis D3 exhibited perceptible hypoglycaemic activity at a micro dose level ranging from 25 μ ml. to 75 μ ml. 100 gm. b.w. through oral I.P. route of administration. While the normal and corresponding alcohol fed controls exhibited no such activity, Syzygium Jambolanum ∅ has been found toxic at dose level of 50 μ ml. 100 gm. b.w. similar to the corresponding control. Abroma Augusta ∅ although has mild hypoglycaemic effect in doses of 50 μ ml. to 0.1 ml., yet it does not stabilise blood sugar level corresponding such activity.

Observation more than books, experience rather than persons are the prime educators.

A. Beonson Alcott