IMPORTANCE OF TRADITIONALLY USED MEDICINAL PLANTS: *EMBLICA OFFICINALIS* (L), *CURCUMA LONGA* (L) & *SYZYGIUM CUMINI* (L) IN THE MANAGEMENT OF DIABETES MELLITUS

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ABSTRACT

Diabetes mellitus is a serious malfunction affecting more than 200 million people worldwide. Indian scenario approximates 20% in urban and 10% in rural populations are diabetic. Traditional medicines have remained as a component of health care system playing an important role in controlling different health problems including Diabetes Mellitus. Present study explores the importance of three traditionally used medicinal plants i. e. *Emblica officinalis* (L), *Curcuma longa* (L) & *Syzygium cumini* (L) as a component in 50 nos of hypoglycemic herbal formulations comprising a combination of more than 150 herbs in the management of Diabetes Mellitus. These three plants cover 28.3% while remaining 147 ingredients supports the 71.7% of the constituents. Significant high percentage of ingredients clearly indicates the mere hypoglycemic role of these three plants. Identification of bioactive principles of these plants may enhance the discovery of a new novel, cost effective drug although may need little biotranformation for its bioefficacy.

Keywords: Diabetes Mellitus, ayurveda, *Emblica officinalis*, *Curcuma longa*, *Syzygium cumini,* polyherbal.

INTRODUCTION

Diabetes Mellitus (DM) is a globally considered most common endocrine malfunction resulting from metabolic disturbances; mostly prevailing in the developing and newly industrialized countries affecting all classes of people (1,2,3). It is one of the top five leading causes of death in most developed countries estimating more than 200 million people worldwide have DM (2, 3).

Current Indian diabetic scenario is very astonishing, calculating a prevalence rate of approximately 20% in urban populations and approximately 10% in rural populations (4).

Diabetes Mellitus has been observed since the remote past of human civilization as it is cited in *Veda* and *Ayurveda*. In the life science context, '*Ayurveda*' is the first to identify, diagnose and to manage this dis-

ease. There is a miraculous interrelation between the *vedas* and *Ayurveda* since the both are science and deals with life of human being also. The history of Indian medicines reflects its development from *vedic* era to modern *Ayurvedic* pharmaceutics (*Dravyaguna*) passing through *samhita* (*Ayurvedic* text) era. *Ayurveda*, the science of life, which has highly effective treatment for a number of tough diseases, also has effective and successful treatment for Diabetes Mellitus (*Madhumeha*).

Herbal formulations play an important role in controlling many chronic health problems including Diabetes Mellitus. Ancient Indian literature incorporates a remarkably broad definition of medicinal plants and considers all plant parts to be potential sources of medicinal substances (6). Traditional medicinal practices have remained as a component of health care system of many societies in spite of the availability of well-established alternatives (7).

There are so many poly herbal and herbo-mineral formulations globally available in the market used for prevention & controlling of T-2 Diabetes (*Madhumeha*) revealed in *veda* and *Ayurveda*. The present study is designed to explore the importance of three commonly available medicinal plants i. e. *Emblica officinalis* (L), *Curcuma longa* (L) & *Syzygium cumini* (L) as a component in 50 nos. of different classical, patent and propritory polyherbal and herbomineral hypoglycemic formulations of *ayurvedic* medicine systems comprising a variety of combination of more than 150 herbs of different families in the management of Diabetes Mellitus.

Materials and methods:

In the present study, three different traditionally used hypoglycemic plants namely- 1. Emblic Myrobaran (*Emblica officinalis*) 2. Turmeric (*Curcuma ronga*) and 3. Jaman (*Syryzium cumini*) were selected for screening as ingredients used in fifty different polyherbal & herbomineral classical, patent & proprietary medicines (formulations). Inclusion criteria of these three plants were based on traditional used and easy availabilities. The formulations were randomly selected based upon its evidence as (a) *ayurvedic* medicines, (b) oral hypoglycaemic formulation and (c) polyherbal and herbomineral compositions. The fifty formurations are accordingly (in brackets name of pharmaceuticals is mentioned) : **1.** A D powder (Sanjeevani) **2.** AD cap (Doctor) **3.** AD Pills (Sanjeevani) **4.** Ayush 82 (CCRAS), **5.** Carbome*t* Compound tab (Akshay) **6.** *Chandraprabha bati* (Classical) **7.** *Chandrakala bati* (Classical) **8.** DBN tab (Indian) **9.** *Devadarvadya Rista* (Classical) **10.** Diabe Cap (RDP) **11.** Diabecon tab (Himalaya) **12.** Diabe tab- H Cap (*Madhur*) **13.** Diabetes cap (Upper India) **14.** Diabetes strong cap (Multani) **15.** Diabetomed tab (Surya) **16.** Diabin cap (J & S) **17.** Diabit Cap (Pride) **18.** Diabnil cap (Prabhat) **19.** Diacont tab (Baidyanath) **20.** Diaplex syp (Maac) **21.** Diatus tab (Pearl) **22.** Diarpin cap (Nupal) **23.** Diano tab (Padmavati pharmaceuticals) **24.** Glucodap cap (ADP) **25.** Glucomap tab (Maharishi) **26.** Glufac cap (Adfac) **27.** Glycen cap (Capro) **28.** *Go-*

ranchi tab (Sagar) **29.** Hyponidd tab (*Charak*) **30.** Hita Tea (Jain), **31.** Insol - N tab (Muniyal), **32.** Jamed cap (*Ayurchem*), **33.** K- 4 tab (Zandu), **34.** Losubit cap (Anuja), **35.** M M tab (*Bajranga*), **36.** *Madhumardana siddhi* powder (Bharath), **37.** *Madhumardana* Powder (Jain), **38.** Madhumerin tab (Kashmir), **39.** Madhulene tab (Trigunaya), **40.** *Madhuna* powder (Anchan), **41.** *Madhusudana* cap (Pavaman), **42.** *Meha* cap (Ram Tirtha), **43.** *Mehantak bati* (Akshar), **44.** Mersina cap (Classical), **45.** *Mehamudgarvati* (J & J), **46.** *Parinam* (BVP), **47.** Shugrol cap (Yogi), **48.** Ulsant D- liquid (Ayuchem), **49.** *Vasantakusumakar Ras* (Classical), and **50.** Vilvam tab (SKM Siddha & *Ayurveda*). The antidiabetic formulations which have no indication for the management of Diabetes were excluded in this study. The selected three ingredients were screened separately in fifty different antidiabetic classical, patent & proprietary medicines (formulations) manufactured by various pharmaceuticals made in different forms like tablet, capsules, powder, syrup, *Arista*. Three selected plants were *Emblica*

officinalis (L)**,** *Curcuma longa* (L) & *Syzygium cumini* (L)

RESULTS AND DISCUSSION

The present study revealed that 150 numbers of herbal ingredients were randomly used in 50 numbers of different *ayurvedic* formulations. Among them three commonly and traditionally used antidiabetic plants were screened for its presence in the formulations. The formulations were of varied forms; viz., tablet (23), capsules (19), powder (04) and others (like *Arists*, Syp, Liq & Tea) (04).

The different pharmaceutical organization used the selected plants' ingredients viz., *Emblica officinalis* (L), *Curcuma longa* (L) & *Syzygium cumini* (L) as a component in 50 nos. of different classical, patent and propritory polyherbal and herbomineral hypoglycemic formulations of *ayurvedic* medicine systems thus exploring their efficacy and qualities as an antidiabetic medicine. The frequency of using these three plants' ingredients is shown in table – I.

Table – I

Name of selected herbal ingredients	Total nos. of formulations	Nos. of ingredients used in formulations	Percentage of ingredients used in formulations
1. *Emblica officinalis*	50	35	70
2. *Curcuma longa*	50	29	58
3. *Sygyzium cumini*	50	32	64

The average percentage of concentrations of *Emblica officinalis* (L), *Curcuma longa* (L) & *Syzygium cumini* (L) as a component in 50 nos. of different formulations were 7%,

7.3% and 14% respectively. Out of 150 numbers of ingredients these three plants covers 28.3% of its constituents while remaining 147 ingredients supports the 71.7%

of the constituents. Thus, statistically significant high percentage of ingredients clearly indicates the hypoglycemic role of these three plants. The presence or absence of these three hypoglycemic plants in the screened 50 numbers of formulations are included in table – II.

Table – II

Sl. No.	Name of formulation	Total nos. of herbs used as ingredients	Composition in formulation		
			Emblica officinalis	*Curcuma longa*	*Sygizium cumini*
1.	AD Powder	12			
2.	AD pills	12			
3.	AD cap	19			
4.	*Ayush* 82	…………..			
5.	Carbomet Compound tab	9			-
6.	*Chandraprabha bati*	30			-
7.	*Chandrakala bati*	5		-	-
8.	DBN tab	11			
9.	*Devadarvadya Rista*	29			-
10.	Diabe cap	16		-	-
11.	Diabetes strong cap	8			
12.	Diabecon tab	27			
13.	Diabetab – H cap	6	-		-
14.	Diabetes cap	20		-	-
15.	Diametomed tab	6	-		-
16.	Diabin cap	8	-		
17.	Diabit cap	14			-
18.	Diabnil cap	10	-		
19.	Diacont tab	5	-	-	
20.	Diaplex syp	11	-		
21.	Diatus tab	20	-	-	
22.	Diawin cap	13		-	
23.	Glucodop cap	5		-	
24.	Glucomap tab	6	-	-	
25.	Glycen cap	8			-
26.	Glufac cap	11			

No.	Name	Count			
27.	*Goranchi* tab	5			
28.	Hypnoid tab	10			-
29.	Hita tea	7			-
30.	Insol – N tab	6		-	-
31.	Jomed cap	11		-	-
32.	*Jambu* Hills	1	-	-	
33.	K – 4 tab	33		-	-
34.	Losubit cap	11			
35.	M M tab	6		-	-
36.	*Madhumardana* Siddhi Powder	6			
37.	*Madhumardana* Powder	7			
38.	Madhulene tab	8	-	-	
39.	*Madhuna* powder	10			-
40.	*Madhumerin* tab	8	-		-
41.	*Madhusudana* cap	14		-	
42.	*Mehamudgar vati*	11			-
43.	*Meha* cap	34			
44.	*Mehantak* bati	14			
45.	Mersina cap	5	-	-	
46.	*Parinam* tab	5			
47.	Shugrol cap	17	-	-	
48.	Ulsant D- Liquid	10		-	-
49.	Vilvam tab	7	-	-	
50.	*Vasantakusumakar Ras*	8	-		-

' ' indicates presence '-' indicates absence

Many antidiabetic formulations are in the market and are used regularly by diabetic patients on the advice of the physicians. Presence of these tree plant species in almost all antidiabetic *ayurvedic* drugs clearly indicates the importance of these plant species. Diabecon manufactured by 'Himalaya' is reported to increase peripheral utilization of glucose, increase hepatic and muscle glucagon contents, promote cells repair and regeneration and increase C peptide level. It acts as an antioxidant in cells' diabetic oxidative stress. It reduces the glycated haemoglobin levels exerting its insulin-like action and normalizes the microalbuminurea and modulates the lipid profile. It minimizes long term diabetic complications. Diabecon has 27 herbal products having three impotant plant species. *Mehantek Bati*, is prepared from 14 herbs and all these three

plant species are used as active ingredient. In *Parinam* tab, only 5 plant species are used and among these five species three are important species. Plant contains compounds like glycosides, saponins, alkaloids, phenolic compounds, oils, free acids, polypeptides, sterols that might caused reducing blood glucose level utilizing peripheral sugar etc. Amino acid methionine and a crystalline product named p-insulin reported to have hypoglycemic activity in addition to being antihaemorrhoidal, astringent, stomachic, emmenagogue, hepatic stimulant, and antihelmintic and blood purifier is plant origin.

CONCLUSION:

One of the major problems with this herbal formulation is that the active ingredients are not well defined. It is important to know the active component and their molecular interaction, which will help to analyze therapeutic efficacy of the product and also to standardize the product. Efforts are proceeded to investigate the mechanism of action of some of these plants using model systems which is the future prospects of further research in the area of phytochemistry of antidiabetic plants thus leading to the discovery of a new novel and effective drug against diabetes mellitus which may need little biotransformation for its efficacy.

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