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Research Article

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STANDARDIZATION OF AYURVEDIC POLYHERBAL FORMULATION: ANTIDIABETIC CHURNA

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ABSTRACT
Ayurvedic medicine Anti-diabetic churna known to be effective in all types of madhumeha (Diabetes Mellitus) including polyuria, has been standardized by following modern scientific quality control procedures both for the raw material and the finished product. The obtained values of physical and chemical parameters can be adopted to lay down new pharmacopoeial standards to be followed for traditional preparation of Anti-diabetic churna with batch-to-batch consistency. The phytochemical constituents found to be present in the raw material used for the preparation of Anti-diabetic churna possibly facilitate the desirable therapeutic efficacy of the medicinal formulation, and also could help in knowing the underlying mechanisms of pharmacological action.
KEYWORDS: Standardization, Anti-diabetic churna, Ayurvedic formulation, Diabetes mellitus, Pharmacopoeial standards.

INTRODUCTION

Anti-diabetic churna (AC) an Ayurvedic polyherbal formulation, consists of Jamun (*Eugenia Jambolana*) and other 7 ingredients in churna (powder) form. It supposes to have be multi-faceted action in all types of Diabetic conditions; including polyuria. Preparation of AC is based on traditional methods in accordance with the procedure given. Due to lack of modern pharmacopoeial standards laid down and followed for processing of AC using traditional methods, the medicine prepared may not have the desired quality and batch-to-batch consistency. Hence, there is a need for standardization of AC following scientific parameters including organoleptic characters, chemical analysis, and chromatographic pattern. The work was undertaken to standardize and validate Ayurvedic medicine, Anti-diabetic churna used in the treatment of madhumeha. Standardization of AC was carried out following Good Manufacturing Practices (GMP) for preparation of ayurvedic medicine. Standardization of guidelines for herbal products provided by World Health Organization (WHO) and European Agency for the Evaluation of Medicinal Products (EMEA) have also been followed.[1]

MATERIALS AND METHODS

An Antidiabetic churna was collected from local market, karad.

This is a polyherbal formulation consisting of 8 ingredients in all, with specific morphological parts of the plants (herbs) used and each ingredient being of equal quantity. For standardization of AC, some modifications were made. Jamun (seed), Karela (Fruit), Neem (Leaves), Methi (Seed), Amala (Pulp Of Fruit), Saptarangi (Root and stem), Kadu jire (Seed), Kadvinai (whole plant), known to have antidiabetic properties. The AC was procured from the local market or from , after a preliminary identification was made based on the Ayurvedic parameters such as (colour), gandha (odour), ruchi (taste), aakruti varna (shape) and parimana (size). The material was examined for probable adulterants and foreign matter adhering to the surface was removed. Organoleptic evaluation was used for identification of sensory characteristics like colour, odour, taste, shape, size, texture and fracture.. Microscopic evaluation and cytomorphological evaluation were not done as detailed phytochemical analysis was performed. The material was dried and then considered for quality analysis. Active phytochemical constituents like glycosides flavonoids, alkaloids, acids, gums, tannins, were identified through qualitative chemical analysis in each of the ingradients.

Table: 1 Ingredients of Antidiabetic Churna

Sr. No.	Plant Name	Biological name	Parts used
1	Jamun	*Eugenia jambolana*	Seed
2	Karela	*Momordica charantia*	Fruit
3	Neem	*Azadirchata indica*	Leaves
4	Methi	*Trigonella foenum graecum*	Seed
5	Amala	*Embelica officinalis*	Pulp of fruit
6	Saptrangi	*Casearea esculanta*	Root and Stem
7	Kadu jire	*Veronia anthelmentica*	Seed
8	Kadvinai	*Corallocarpus epigaea*	Seed

Thin layer chromatography (TLC) was performed and R_f values were calculated for standardization parameters including foreign. Quantitative analysis of the raw material was done organic matter, water soluble extractive, methanol soluble extractive, total ash and acid insoluble ash. Their values were calculated and found to be well within the available standard ranges. Other parameters, moisture content, pH were also assessed. The approved raw material was packed in sterilized airtight polybags with proper labeling and stored in a cool place. Hygienic conditions were maintained by regular disinfecting of the work areas. The finished product obtained, was subjected to chemical treatment similar to that given to the raw material to inhibit microbial growth. It was then dried at 60^0C. The above detailed procedures were adopted for 6 batches of AC prepared. Statistical analysis was done 'Mean', 'Standard Deviation (SD)' and 'Standard Error (SE)' values are given as also 'Range' and Median' values wherever applicable.[2,3]

RESULTS AND DISCUSSION

As part of standardization procedure, all 3 batches of the finished product of AC were tested for relevant physical and chemical parameters Quality tests (Table 3) for AC were performed for moisture content, water soluble extractive, methanol soluble extractive, ash content, and acid insoluble ash, and were found to be within standard ranges . Values of pH and alcohol soluble extractive were assessed. In addition, TLC was done (Fig. 1) with methanol extract of Anti-diabetic churna. Ethyl acetate and toluene (3:7) was used as the mobile phase and iodine vapors as visualizing agent. Rf values (Table 3) were calculated. Standardization of Anti-diabetic churna parameters concerning the quality of the raw material was possible by considering various scientific used, keeping intact procedures in accordance with Ayurvedic System. Values obtained

after conducting tests for moisture content, water soluble extractive, methanol soluble extractive, ash content, acid standards laid down for herbal material. The 'Mean' insoluble ash for AC were in conformance with the value obtained for each parameter was found to be consistent across 3 batches with minimum 'SD'. For pH, alcohol soluble extractive, there are no standard ranges available. The 'Mean' value obtained for each of these parameters was also found to be consistent across 3 batches with minimum 'SD'. The occurrence of spots at the same respective locations in TLC (Fig. 1) obtained for all 3 consecutive batches confirms the batch-to-batch consistency of the finished product. The Phytochemical constituents in Anti-diabetic *churna* like glycosides, flavonoids, alkaloids, acids, gums, tannins could have pharmacological action on their own or in conjunction with body fluids, in terms of efficacy.[1,2,3]

CONCLUSION

The result obtained would be used to lay down a set of new pharmacopoeial standards for the preparation of anti-diabetic churna to obtained optimal efficacy of the medicine. The phytochemical screening of churana shows effects like positive tests of glycosides, alkaloids, tannins, acids etc. as per specifications chemical constituents present on the churana.

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Table: 2 Phytochemical Constituents of Anti-Diabetic Churna

Plant Name	Glycoside	Flavonoids	Alkaloids	Acids	Gums	Tannins	Fixed Oils	Resin
Jamun	+			+		+		
Karela	+	+	+	+	+			
Neem	+	+			+			
Methi			+		+		+	
Amala					+	+	+	+
Saptrangi	+		+		+	+	+	+
Kadu jire				+	+			+
Kadvinai				+	+			

Figure 1: TLC profile of Anti -diabetic churna

Table : 3 Result of Evaluation test

Parameter	Standard Values	Batch 1 (Obtained value)	Batch 2 (Obtained value)	Batch 3 (Obtained value)	Mean (S.D.)
Moisture content (%)	≤ 10	5.3	5.7	5.5	5.5±0.2
Water soluble extractive (%)	10-20	13.6	13.8	13.9	16.76±0.1
Alcoholic Soluble extract	15-20	19.2	18.8	19	19±o.2
Ash content (%)	7-11	8.5	7.8	8.1	8.13 ±0.3
Acid insoluble ash (%)	≤ 2	0.5	0.7	1.1	0.76±0.3
pH	-	4.4	4.8	4.6	4.6±0.2
TLC, (No. of spots)	-	1	1	1	1±0
R_f value	-	0.9	0.88	0.82	0.86±0.04

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