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Phytochemical investigation and Pharmacological screening of polyherbal preparation

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A B S T R A C T

The present paper deals with the investigation on comparative physico-chemical and phytochemical screening of five medicinal plants viz., leaves of *Gymnema sylvestre*, fruits of *Momordica charantia*, rhizomes of *Curcuma longa*, seeds of *Eugenia jambolana* and fruits of *Embilica officinalis* widely used in the treatment of diabetes. In the present communication comparative results were shown. Various macroscopic, physicochemical and phytochemicals parameters were analyzed and were presented.

Key-Words: Medicinal Plants, Screening, Diabetes

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INTRODUCTION

Medicinal plants are various plants used in herbalism and thought by some to have medicinal properties. Few plants or their phytochemical constituents have been proven to have medicinal effects by rigorous science or have been approved by regulatory agencies such as the United States Food and Drug Administration or European Food Safety Authority. India is a country known for ancient scripts, the number system, invention of zero and Vedas. Medicines in India are used by about 60 per cent of the world's population. These are not only used for primary health care not just in rural areas in developing countries, but also in developed countries as well where modern medicines are predominantly used. While the traditional medicines are derived from medicinal plants, minerals, and organic matter, the herbal drugs are prepared from medicinal plants only.[1] The present paper deals with the comparative physico-chemical and phytochemical screening of some medicinal herbs used in the treatment of diabetes.

MATERIAL AND METHODS

Selection, collection and authentication of plant/plant material

The different fresh plant parts viz., leaves of *Gymnema sylvestre*, fruits of *Momordica charantia*, rhizomes of *Curcuma longa*, seeds of *Eugenia jambolana* and fruits of *Embilica officinalis* were collected in the months Jan 2021 to March 2021from the in and around local areas of Jaipur Rajathan. A

Pharmacognostical Evaluation Morphological features

The macroscopy/morphology of different parts of the selected plant such as color, odor, size, shape, taste, surface characters and fractures were carried out.[2]

Physicochemical Evaluation

The dried parts were subjected to standard procedure for the determination of various physicochemical parameters[3-5].

Extraction of Plant Material

Sample were shattered and screened with 40 mesh. The shade dried coarsely powdered (250gms) were loaded in Soxhlet apparatus and was extracted with ethanol until the extraction was completed. After completion of extraction, the solvent was removed by distillation. The extracts were dried using rotator evaporator. The residue was then stored in dessicator and percentage yield were determined. [6-7]

Preliminary Phytochemical Screening of Extract The ethanolic extract obtained after extraction were subjected for phytochemical screening to determine the presence of various phytochemical present in the extracts. The standard procedure were adopted to perform the study.[8-9]

RESULTS AND DISCUSSION

Morphological features

The macroscopy/ morphological features of selected medicinal herbs viz., leaves of *Gymnema sylvestre*, fruits of *Momordica charantia*, rhizomes of *Curcuma longa*, seeds of *Eugenia jambolana* and fruits of *Embilica officinalis* were studied and were presented in Table No. 1.

Table 1: *Morphological features of selected Medicinal herbs used in the treatment of Diabetes*

S/No.	Name of the Plant/drug	Plant Part	Size	Shape	Colour	Odour	Taste
1.	*Gymnea sylvestre*	Leaves	2-6 cm length 1-4 cm width	Simple, Petiolate, rounded to cordate base	Green	Characteristics	Slightly Bitter and Astringent
2.	*Mormodica charantia*	Fruits	2.5-25 cm long 2-7 cm diameter	Elongated, fusiform, longitudinally grooved, ridged	Green	Characteristics	Bitter
3.	*Curcuma longa*	Rhizome	3-6 cm long 3-8mm diameter	Curved, irregular, cylindrical	Greyish yellow	Slight	Very bitter
4.	*Eugenia jambolana*	Seed	1-2 cm diameter	Oval or round	Cream	Characteristics	Slightly bitter and astringent
5.	*Emblica officinalis*	Fruits	2-4 cm length 1-4 cm width	Rounded	Brown to blackish brown	Characteristics	Sour and astringent

Table 2: Physico-chemical evaluation of some Selected Antidiabetic Medicinal Plant

S/No.	Parameters	Values Obtained (% w/w)				
		GSL	MCF	CLR	EJS	EOF
1.	Total ash (TA)	8.44	7.0	7.98	8.40	8.78
2.	Water soluble ash (WSA)	1.06	3.78	1.36	3.20	1.025
3.	Acid insoluble ash (AIA)	3.78	0.30	1.12	1.20	0.59
4.	Moisture content (MC)	2.23	3.48	2.93	4.51	3.52
5.	Swelling index (SI)	2.90	3.21	1.56	4.28	4.68
6.	Foreign organic matters (FOM)	2.1	0.9	1.9	1.31	1.92
7.	Water soluble extractive value	25.12	35.23	8.65	22.20	33.10
8.	Alcohol soluble extractive value	18.92	20.41	22.49	14.94	24.56
9.	**Pet. ether soluble extractive value**	**11.50**	**9.58**	**12.41**	**27.30**	**18.32**

The photographs were given in Fig. 1 to 5.

Figure 1: Leaves of *Gymnema sylvestre*

Figure 2: Fruits of *Momordica charantia*

Figure 3: Rhizomes of *Curcuma longa*

Figure 4: Seeds of *Eugenia Jambolana*

Figure 5: Fruits of *Embilica officinalis*

Physicochemical Evaluation

The physicochemical evaluation of selected medicinal herbs viz., leaves of *Gymnema sylvestre*, fruits of *Momordica charantia*, rhizomes of *Curcuma longa*, seeds of *Eugenia jambolana* and fruits of *Embilica officinalis* were carried out. Air dried material was used for quantitative determination of physiochemical values In this study ash values (total ash, acid insoluble ash and water soluble ash), moisture content, swelling index and foreign organic matters were determined (Table 2).

Table 2: Physico-chemical properties of some Selected Antidiabetic Medicinal Plant

S/No.	Parameters	Values Obtained (% w/w)				
		GSL	MCF	CLR	EJS	EOF
1.	Total ash (TA)	8.44	7.0	7.98	8.40	8.78
2.	Water soluble ash (WSA)	1.06	3.78	1.36	3.20	1.025
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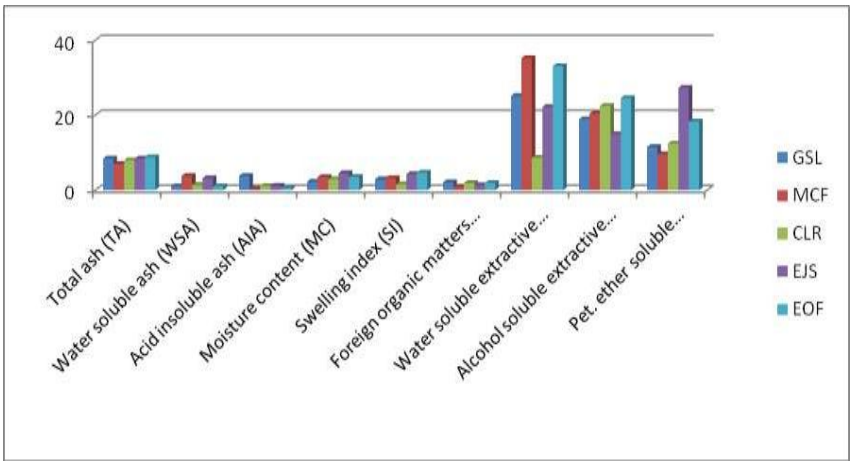


Graph 1: Physico-chemical evaluation of selected Medicinal her**b**

Comparative studies were performed and were presented in table. Graph 1 showed comparative physicochemical evaluation of leaves of *Gymnema sylvestre*, fruits of *Momordica charantia*, rhizomes of *Curcuma longa*, seeds of *Eugenia jambolana* and fruits of *Embilica officinalis* Pet. ether, alcohol and water soluble extractives were determined and were recorded. Alcohol and water extractive was determined as per WHO recommendations while petroleum ether soluble extractive was determined due to the medicinal attributes of the extract. Water soluble extractive was found to be very high in most of the extract when compared to other extractable matter in the drug. In some extract alcohol soluble extractive value was recorded more, whereas pet. ether soluble extractive value was found to be least.

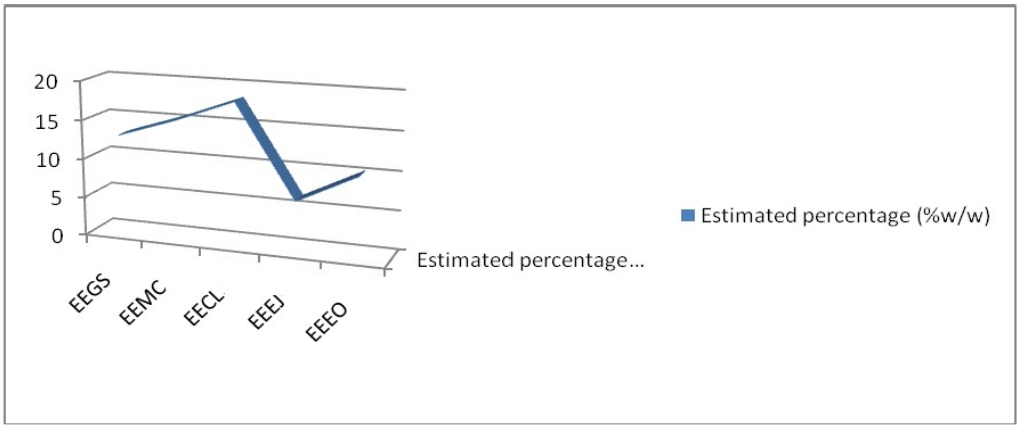
Extraction of Plant Material

The shade dried coarsely powder of selected medicinal herbs viz., leaves of *Gymnema sylvestre*, fruits of *Momordica charantia*, rhizomes of *Curcuma longa*, seeds of *Eugenia jambolana* and fruits of *Embilica officinalis* were extracted ethanol in a soxhlet apparatus. The solvents were removed by distillationunder reduced pressure and the resulting semisolid mass was vacuum dried using rotary flash evaporator. The percentage yields of ethanolic extract of selected medicinal herbs along with their color, nature and pH were presented in table 3. Graph 2 shows comparative percentage extractive value.The percentages EECL were found to be maximum 18.25, followed by EEMC 15.39, EEGS 12.92,EEEO 10.28 and EEEJ 6.45. The color of extract ranges which were reported in table no. 3. The natures were solid to semi-solid whereas the pH was found to be neutral in all the extract selected for present investigation.

Table 3: Percentage yield of ethanolic extracts of some Selected Antidiabetic Medicinal Plant

S./No.	Extract	Estimated percentage (%w/w)	Color of extract	Nature of extract	pH
1.	EEGS	12.92	Green	Semi Solid	**7.03**
2.	EEMC	15.39	Dark Green	Semi Solid	**7.05**
3.	EECL	18.25	Pale White	Solid Powder	**7.00**
4.	EEEJ	6.45	Dark Grey	Semi solid	**7.02**
5.	**EEEO**	**10.28**	**Blackish Green**	**Sticky semi Solid**	**7.06**

Abbr: EEGS Ethanolic extract of *Gymnema sylvestre* leaves E EMC: Ethanolic extract of *Momordica charantia* fruits EECL: Ethanolic extract of *Curcuma longa* rhizomes EEEJ: Ethanolic extract of *Eugenia jambolana* seeds EEEO: Ethanolic extract of *Embilica officinalis* fruits



Graph 2: Percentage yield of ethanolic extracts of some Selected Antidiabetic Medicinal Plant

Preliminary Phytochemical Screening of Extract The extract obtained after extraction of plant material were subject to phytochemical screening which revealed the present of various active phytoconstituents. The results were presented in table 4.

Table 4: Preliminary phytochemical screening of some Selected Antidiabetic Medicinal Plant

S/No.	Constituents	Extracts of Medicinal Herbs				
		EEGS	EEMC	EECL	EEEJ	EEEO
1.	Carbohydrates	+	+	+	-	+
2.	Glycosides	+	+	+	+	+
3.	Alkaloids	+	+	+	+	+
4.	Protein & Amino acid	-	+	+	+	-
5.	Tannins & Phenolic compounds	-	-	+	+	+
6.	Flavonoids	-	+	+	+	-
7.	Fixed oil and Fats	-	+	+	-	-
8.	Steriods & Triterpenoids	+	+	+	+	-
9.	Waxes	-	-	-	-	-
10.	Mucilage & Gums	+	-	-	-	-

Abbr. - = Absent, + = Present

CONLUSION:-

In the present study comparative results of some anti diabetic plants were shown Various macroscopic, physicochemical and phytochemicals parameters were analysed.

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