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Phytochemical studies in leaf drug *Gymnema sylvestre* (Retz.) R.Br. ex Schult.

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ABSTRACT

Gymnema sylvestre (Retz.) R.Br. ex Schult. is much branched, twining shrubs with terete stem belonging to family Asclepiadaceae. Its leaves are medicinally exploited to treat several diseases and disorders. Being an important ayurvedic drug it is deliberately adulterated. Phytochemical studies in this leafy drug are carried out to standardize and detect the adulteration in it. The phytochemical studies include details of characters of leaf powder like colour, odour, taste, Alkaloids, Anthraqinone, Iridoids, Saponins, Steroids, Tannins (Qualitative) and dry matter, bulk density, nitrogen, Water soluble nitrogen, crude protein, crude fat, crude fiber, total ash, acid insoluble ash, acid soluble ash, water insoluble ash, water soluble ash, calcium, reducing sugar, total sugar, non-reducing sugar, cellulose, gross energy, phosphorus, extractive values in 10 solvents (Quantitative). The above parameters can be applied to standardize this leaf drug.

Keywords: Phytochemical studies, *Gymnema sylvestre* (Retz.) R.Br. ex Schult., adulterations.

INTRODUCTION

Gymnema sylvestre (Retz.) R.Br. ex Schult. is much branched, twining shrubs with terete stem, opposite, ovate or elliptic-lanceolate leaves. Leaves are medicinally exploited to treat several diseases and disorders like or has various properties like Acrid, Alterative, Alexiteric, Anthelmintic, Asthma, Bitter, Bronchitis, Burning sensation, Cooling, Eye complaints, Eye lens problems, Heart diseases, Inflammation, Leucoderma, Piles, Tonic (Kirtikar and Basu, 1984); Biliousness, Cough, Diuretic, Laxative, Sore eyes, Stomachic, Stimulant, Suppression of the sense of taste for sweet and bitter substances (Persaud *et al.*,1999; Intelegen, 2004); Diabetes (Prakash *et al.*,1986; Grover *et al.*,2002; Gholap and Kar,2003; Roy and Indu kumari 2004; Holistic, 2004), Antibacterial (Satdive *et al.*,2003), Heart diseases (Sharma and Kumar,

2001). Being a famous drug there are very chances of adulterations. The adulterations may by deliberate or happened unknowingly. During present investigation an attempt was made to standardize the leaves of Gymea *sylvestre* (Retz.) R.Br. ex Schult. by using some phytochemical parameters.

MATERIAL AND METHODS

The leaf samples were collected from the medium sized authentically identified plant species from different localities of Marathwada. The leaves were removed carefully by hand pricking without damaging the plants. The leaves were collected in polythene bags and brought to the laboratory within 2-5 hours. The leaves were initially dried in shade and later in oven at 60°C till constant weight, then made in to fine powder and stored in sealed plastic container for further analysis (Sadasivam and Manickam, 2008). The phytochemical analysis was carried out using standard procedures. The phytochemical parameters obtained from studies are useful to know the adulterations in leaf drug *Gymnema sylvestre* (Retz.) R.Br. ex Schult. The phytochemical studies include details of characters of leaf powder like colour, odour, taste, dry matter, bulk Density, nitrogen, water Soluble Nitrogen (WSN), crude protein, crude fat, crude fiber, total ash, acid insoluble ash, acid soluble ash, water insoluble ash, water soluble ash, calcium, reducing sugar, non-reducing sugar, total sugar, cellulose, extractive values, gross energy, phosphorous etc.

RESULTS AND DISCUSSION

All above mentioned characters were found to be diagnostic to find adulteration in the leaf drug *Gymnema sylvestre* (Retz.) R.Br. ex Schult..

Phytochemical characters of leaf powder

Table 1: Physical characters

Sr. No.	Character	Expression
1	Colour	Faint green
2	Odour	Disagreeable
3	Taste	Bitter astringent

Table 2: Qualitative phytochemical characters

Sr. No.	Character	Expression
1	Alkaloids	+
2	Anthraqinone	-
3	Iridoids	-
4	Saponins	+
5	Steroids	+
6	Tannins	+

Table 3 Quantitative phytochemical characters

Sr. No.	Character	Expression %
01	Dry Matter (DM)	14.9
02	Bulk Density	0.435 mg/cm^3
03	Nitrogen (N)	2.16

Table 3 : Continued...

Sr. No.	Character	Expression %
04	Water Soluble Nitrogen (WSN)	1.625
05	Crude Protein (CP)	13.5
06	Crude Fat (CFat)	12.4
07	Crude Fibre (CF)	17.45
08	Total Ash (TA)	7.15
09	Acid Insoluble Ash (AIA)	0.45
10	Acid Soluble Ash (ASA)	6.7
11	Water Insoluble Ash (WIA)	1.5
12	Water Soluble Ash (WSA)	6.1
13	Calcium (Ca)	1.663
14	Reducing Sugars	1.35
15	Non Reducing Sugars	0.558
16	Total Sugars	1.908
17	Cellulose	15.9
18	Gross Energy (GE)	4 Kcal/gm
19	Phosphorus (P)	0.16

Table 4 Extractive values

Sr. No	Solvent	Extractive Value
01.	Extractive value in Water	19
02.	Extractive value in Acetone	2.2
03.	Extractive value in Butanol	2.8
04.	Extractive value in Chloroform	2.2
05.	Extractive value in Diethyl Ether	3.4
06.	Extractive value in Ethyl Alcohol	8.2
07.	Extractive value in Methanol	19.2
08.	Extractive value in Petroleum Ether	1.2
09.	Extractive value in Propanol	4.6
10	Extractive value in Toluene	1.8

The parameters like faint green colour, disagreeable odour, bitter astringent taste, presence of Alkaloids, Saponins, Steroids and Tannins give preliminary idea about authenticity of drug (Tables 1 & 2) while quantitative chemical parameters like dry matter 14.9 %, bulk density 0.435 mg/cm^3, Nitrogen 2.16 %, 1.625 % water soluble nitrogen, crude proteins 13.5 %, crude fats 12.4 %, crude fibers 17.45 %, total ash 7.15 %, acid insoluble ash 0.45 %, acid soluble ash 6.7 %, water insoluble ash 1.5 %, water soluble ash 6.1 %, Calcium 1.663 %, reducing sugar 1.35 %, non-reducing sugar 0.558 %, total sugar 1.908 %, cellulose 15.9 %, gross energy 4 K cal/ gm, Phosphorous 0.16 % (Table 3) together can be exploited for making certain that raw material is genuine for predicting quantum of adulteration. The extractive values in Water 19 %, Acetone 2.2 %, Butanol 2.8 %, Chloroform 2.2 %, Diethyl Ether 3.4 %, Ethyl alcohol 8.2 %, Methanol 19.2 %, Petroleum ether 1.2 %,, Propanol 4.6 %, Toluene 1.8 % are conclusive parameters (Table 4).

Conflicts of interest: The authors stated that no conflicts of interest.

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