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RESEARCH ARTICLE

PHARMACOGNOSTIC AND PRELIMINARY PHYTOCHEMICAL STUDIES ON THE LEAF EXTRACTS OF *DIGERA MURICATA* (L.) MART.,

***Dr. R. Karthiyayini**

Department of Botany, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore-641043, Tamilnadu, India

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ABSTRACT

Digera muricata (L.) Mart. Leaves were selected to screen pharmacognostic and phytochemical studies. Plant material was collected from farmlands in Coimbatore district, Tamilnadu, India. *Digera muricata* (L.) Mart. is a well-known leafy vegetable and also a medicinal plant, which has been valued in ancient system of medicine. The leaf extracts of various solvents were subjected to organoleptic, fluorescence analysis, physicochemical analysis and preliminary phytochemical screening. The study contributes to the development of standardization parameters of herbal drugs used in our system of medicine

INTRODUCTION

India, the richest floristic regions of the world has got a source of plants and their products since ancient times. Men use plant as food and medicine as per his desires. Among the entire flora, estimated 2,500,000 higher plant species on the earth, only 35,000 to 70,000 species have been used for medicinal purpose (Ponnu *et al*., 2003; Jain *et al.,* 2010). Recently, considerable attention has been paid to utilize eco- friendly and bio- friendly plant based products for the prevention and cure of different human diseases. Considering the adverse effects of synthetic drugs, the western population is looking for natural remedies, which are safe and effective (Saha *et al*., 2011). *Digera muricata* (L.) Mart. belongs to the family Amaranthaceae. It is an annual herb growing to 20-70-cm tall. It is widespread in plains of India, as a weed in cultivated fields. The whole part of the plant has medicinal properties and also used as green leafy vegetable. *D. muricata* ethno pharmacologically has been used in renal disorders, aperients, refrigerant (Anjaria *et al*., 2002). The leaves and young shoots of this plant are locally used as a vegetable and given to relieve constipation. *D. muricata* is also used internally against digestive system disorders (ketewa *et al.,* 2004).

Corresponding author: Dr. R. Karthiyayini
Department of Botany, Avinashilingam Institute for Home Science and Higher Education for Women, Coimbatore-641043, Tamilnadu, India.

The present study deals with the pharmacognostical and phytochemical screening of *Digera muricata* L. (Mart) leaves.

MATERIALS AND METHODS

Organoleptic Study

The leaf powder of *Digera muricata,* was used for these studies. The colour variation and taste were the basis for this test as given by Jackson and Snowdown (1968).

Fluorescence Analysis

The fluorescence properties were studied under Ultra-Violet (UV) light adopting method described by Kokosi *et al*. (1958) and Chase and Pratt (1949). The behaviour of the leaf powder with different chemical reagents was studied and the fluorescence characters were observed under visible light and long UV light at 245 nm.

Physico chemical analysis

Physico chemical parameters of the powdered drug such as loss on drying, ash value, extractive value and crude fibre content were performed according to the standard method (Anonymous 1996) and as per WHO guidelines on quality control methods for medicinal plant materials (WHO 1998).

Preliminary Phytochemical Analysis

For the preliminary phytochemical analysis, the extract was prepared by weighing 100 gm of dried powdered leaf and were subjected to maceration with different solvents as per the polarity, methanol, petroleum ether and finally aqueous. The extracts were filtered in each step, concentrated and the solvent was removed by rotary evaporator. The extracts were dried over desiccators and the residues were weighed. The presence and absence of the primary and secondary phytoconstituents was detested by usual prescribed methods (Harbone, 1998).

Test of Alkaloids

Mayer's regent: To 1 ml of the extract, 2 ml of Mayer's reagent was added. Appearance of dull white precipitate indicated the presence of alkaloids.

Test for Flavonoids

To 1 ml of extract, 1 ml of neutral ferric chloride was added. The formation of brown colour confirmed the presence of flavonoids.

Test for Tannin

To 1 ml of the extract, few ml of 5 per cent neutral ferric chloride was added. The development of a dark bluish colour indicated the presence of tannins.

Test for Phenols

To 1 ml of extract, lead acetate solution was added and the precipitate formation indicated the presence of phenolic compounds.

Test for Steroids

Liebermann-Burchard's test: The extracts were dissolved in 2 ml of chloroform to which 10 drops of acetic acid and 5 drops of conc. Sulphuric acid were added and mixed. The change of red colour through blue to green indicated the presence of steroids.

Test for Terpenoids

Salkowski test: 5 ml of each extract was mixed in 2 ml of chloroform and conc. H_2SO_4 (3 ml) was carefully added to form a layer. A reddish brown colouration of the interface was formed to show positive results for the presence of terpenoids.

Test for Quinone

To 1 ml of extract, a few drops of conc. HCl is added. An yellowish brown colour is observed which shows the presence of quinine.

Test for Starch

To 1 ml of extract, a few drops of iodine solution. Any characteristic colour change shows the presence of starch.

Test for Cellulose

To 1 ml of extract, a few drops of iodine solution is added followed by a few drops of H_2SO_4. Dark brown or red colour observed shows the presence of cellulose.

Test for Fixed Oil and Fat

To 1 ml of extract, a few drops of sudan III solution is added. A shining orange colour obtained shows the presence of fixed oil and fat.

RESULTS AND DISCUSSION

Pharmacognostic Study

The phramacognostic characters of the leaf powder have been studied by screening the same through the following parameters.

Organoleptic Study

The investigation on organoleptic study of the leaf powders of *Digera muricata* indicated the characters like colour, odour and taste. The colour of the dried leaf powder was light green. The taste and odour of powder were also tested. The taste of the leaf is bitter and on analysis the leaf powder gives a pleasant odour (Table 1).

Table I. Organoleptic study of the *Digera muricata* leaf powder

1	Colour	Light green
2	Odour	Pleasant
3	Taste	Bitter

Fluorescence Analysis

The leaf powder are treated with various chemicals exhibited various colours in day / visible light and UV light. When the powder treated with 1 N NaOH in methanol shows Greenish yellow colour in day light, brownish yellow colour in UV light. In 1N HCl shows pale green colour in visible light and Light green colour in UV light. In 50% H_2SO_4 the leaf powder exhibited varied dark brown colour in visible light and reddish brown colour in UV light and the results are depicted in Table 2.

Table 2. Fluorescence analysis of the *Digera muricata* leaf powders

S.No	Treatment with chemical reagents	Observation	
		Visible light	UV light
1	Powder as such	Greenish yellow	Dark green
2	Powder + 1 N NaOH IN methanol	Greenish yellow	Brownish yellow
3	Powder + 1 N HCl	Pale green	Light green
4	Powder + 50% H_2SO_4	Dark brown	Reddish brown
5	Powder + ethanol	Green	Light green
6	Powder + 50% Nitric acid	Dark brown	Brownish yellow
7	Powder + ferric chloride solution	Brownish yellow	Dark green
8	Powder + chloroform	Dark green	Yellowish green
9	Powder + Picric acid	Yellowish green	Yellow
10	Powder + Methanol	Green	Dark green

Physicochemical analysis

Analysis of physico chemical constants of the powder has been done to evaluate the quality and purity of the drug and establish identity of it. Ash values of the drug give an idea about the early matter or organic composition and other impurities present along with drug15 the total ash content of the *D.muricata* 3.58%. the water insoluble ash is less than that of acid insoluble ash at and respectively. The water extractive value of *D.muricata* is more than that of ethanol extractive value.

Table 3. Physico chemical evaluation of *Digera muricata* leaf powder

S. No	Parameters	Values % w/w
1	Loss on Drying,	5.3
2	Total Ash value	9.56
3	Acid Insoluble Ash	5.53
4	Water Soluble Ash	3.58
5	Sulphated Ash	0.65
6	Water Extractive Value	60.5
7	Ethanol Extractive Value	19.5

Table 4. Preliminary phytochemical analysis of *Digera muricata* leaf extracts

Name of the compound	Petroleum ether	Chloroform	Methonol	Aqueous
Alkaloids	+	+	+	+
Flavanoids	+	+	+	+
Tannins	+	+	+	-
Phenols	+	+	+	+
Steroids	-	+	+	+
Terpenoids	+	+	+	+
Quinone	-	+	-	-
Starch	+	+	+	+
Cellulose	_	+	+	+
Fixed oil and fat	+	+	+	-

+ - present ; – - absence.

Preliminary phytochemical study

Pharmaceutical preparations derived from natural sources such as vegetables often contain compounds that contribute to the antioxidant defence systems and apparently play a role in the protection against degenerative diseases. The phytochemical screening of various extracts revealed presence of alkaloids, cellulose, flavonoids, phenols, steroids, starch, terpenoids, and tannins (Table 4).

Conclusion

The comparative and multidisciplinary approach to the study of *D.muricata* does help in understanding their identification and medicinal importance. The adulterants in drugs obtain from *D.muricata* can be identify by this investigation. Adulterants if any can be easily identified using these parameters.

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