PHYSICOCHEMICAL STUDIES ON LEAVES OF *SOYMIDA FEBRIFUGA* ADR. JUSS. FAMILY : MELIACEAE

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Abstract

Synthetic drugs produce severe adverse effects and have high rate of secondary failure. The literature survey reveals that principle biologically active compounds of *Soymida febrifuga* which have not been investigated much specially from leaves for the invention of their potential pharmacological benefits. Hence, in this research work we are going to use the leaves of *Soymida febrifuga* plant, because as per traditional information from tribal people this plant has lot of medicinal application. In this research work the plant *Soymida febrifuga* Family- Meliaceae leaves were subjected to determination of Physicochemical parameters. We have determined the Fluorescence behavior of powdered leaves treated with different reagents, total ash value, acid insoluble ash value, water soluble ash value, water soluble extractive value, alcohol soluble extractive value.

Keywords: Soymida febrifuga, Physicochemical parameters, extractive value, Ash value, Fluorescence behavior.

I. INTRODUCTION

India is one of the country in the world having 'God's Blessing' in the form of treasure of medicinal plants. With food, cloth and shelter, healthy life is the main right of human being. Since thousands of years people used to take plant originated products to make life healthy and wealthy too[1].

Soymida ferifuga commonly known as rohan tree of family meliaceae is a reputed tribal medicinal plant. It is found in dry forest such as chota Nagpur, hilly area near Manu Devi in (Jalgoan) district. It contains various complex chemical substances of different compositions which are found as secondary metabolites in one or more parts of this plant such as root, bark, stem bark, heart wood, leaves, flower, fruit and seed etc. These secondary metabolites have ability to alter biological processes, which can reduce the risk of chronic diseases in human beings.

Traditional uses: *Soymida febrifuga* bark extracts are used in treatment of rheumatoid arthritis[2], asthma and good for ulcers[3]. The decoction of the bark has bitter resin used in vaginal infections, rheumatic pains and stomach pains. Bark is used as anti-cancer remedy, used in wounds, dental diseases, uterine bleeding and haemorrhage[2]. It is used as an acrid, refrigerant, anthelmintic agent, aphrodisiac, laxative, good for sore throat, removes vata and cures tridosha fevers, cough, asthma[4].Removes blood impurities, good for ulcers, leprosy, dysentery and it has anti inflammatory activity. The bark is used in intermittent fevers and general debility, in advanced stages of dysentery and diarrhea. It is a good anti malarial like cinchona. It has antimicrobial activity. The bark is astringent to bowels and used in fevers in Yunani medicine, decoction is a good substitute for Oak-bark used for gargles, vaginal infections & enemas. The bark is a bitter tonic. A decoction of bark 1 in 20 was given in one ounce doses three times a day in cases of malarial fever[2]. Decoction of bark is used in tongue sores, fixing loose teeth, gum infection. The bark is crushed and used with water and administered in cough[5].

II. NEED OF STUDY

Most of time there is change in the original characteristics of plant constituents and their pharmacological action too. Because of improper and poor storage condition such as ventilation, more humidity, temperature and light etc. If we use such type of crude drug sample for processing it can lead to change in original characteristic properties and it leads to give the false tests. For avoiding this problem it is necessary to test the crude drug sample by analyzing the Fluorescence behavior using some chemical reagents along with colour change. Secondly it should be test as per (USP) and (IHP) Indian Herbal Pharmacopoeia.

1. Loss on drying.
2. Total ash content.
3. Ash which is insoluble in acid.
4. Ash which is soluble in acid.
5. Ethanol soluble extractive value.
6. Water soluble extractive value.

III. MATERIAL AND METHOD

Plant material collection and Authentication:

Soymida febrifuga leaves were collected from Manu Devi hilly area from (Jalgoan) district (India).The plant specimen was identified and authenticated by Professor Dr. S. R. Kshirsagar, Taxonomist, Department of Botany, S.S.V.P.S's L.K. Dr.P.R. Ghogrey Science College, Dhule (M.S)

Physicochemical analysis:

Collected leaves of *Soymida febrifuga* plant are treated and processed as per the scientific methodology that is shed dried for Physicochemical study.

The leaves were shade dried and powdered using a mechanical grinder for grinded analysis. The physicochemical characteristics of powdered leaves were determined as per the WHO guidelines[6].

Fluorescence behavior:

The fluorescence characteristics of the plant material in different solvents were observed using visible, short UV (254nm) and long UV (365 nm) light[7]. Fluorescence behavior of leave powder and different extract with different chemical reagents such as sodium hydroxide, hydrochloric acid, nitric acid, and sulphuric acid was analyzed to detect the occurrence of phytoconstituents along with colour changes. (See Table No. 1)

Table No. 1 fluorescence behavior of the *soymida. febrifuga* leaf powder with different chemical reagents

Sr. No.	Testing	Visible Light	Short UV (254nm)	Long UV (365 nm)
1	Powder	Green	Green	Blue
2	Powder + 1 N NaOH in ethanol	Dark green	Light Green	Dark blue
3	Powder + HNO_3 (1:1)	Dark brown	Light Green	Dark blue
4	Powder + 1 N HCL	Brown	Dark green	Violet
5	Powder + H_2SO_4 (1:1)	Green	Green	Dark green
6	Powder+ 50% H_2SO_4	Light Green	Light Green	Blue
7	Powder + 50% HNO_3	Light blue	Blue	Dark blue

Loss on drying: [8]

Loss on drying means loss in weight of crude sample in percentage which determines the amount of volatile matter of any kind (including water) that removed under the specified condition. About 1.5gm of powdered drug was weighed accurately in a porcelain dish which was previously dried at 105^0C in hot air oven to constant weight and then weighed. From the difference in weights, the percentage loss on drying with reference to the air-dried substance calculated was 3.34. (See Table No. 3)

Ash Value:[9]

The determination of ash value of crude sample is very important and it is useful in analyzing the quality and purity of crude drug sample. It usually shows the presence of naturally inorganic salts and impurity adhering to it. The main intention of ash value detection is to remove all traces of organic matter which may be interfering in analytical determination. Procedure used for determination of ash values such as total ash, acid insoluble ash, and water soluble ash as per I.P.

Determination of total ash value:

About 2.5gm of powdered drug was weighed accurately into a tarred silica crucible and incinerated gradually up to dull red hot until free from carbon. The crucible was cooled and weighed, repeated for constant value.

Percentage of total ash was calculated with reference to air-dried substance it found to be 9.66. (See Table No. 2)

Determination of acid insoluble ash value:

Ash obtained from the total ash was boiled with 25ml of 2N HCl for few minutes. The insoluble matter was collected on an ashless filter paper, washed with hot water. The filter paper was transferred into a tarred silica crucible and ignited up to dull red hot until free from carbon and weighed. The percentage of acid insoluble ash was found to be 0.68 (Table No. 2).

Determination of acid soluble ash value: The ash obtained from total ash was boiled with 25ml of water for 5 minutes. The insoluble matter was collected on an ashless filter paper, washed with hot water and ignited for 15 minutes at a temperature above 250^0C. The weight of insoluble matter was subtracted from the weight of total ash. The difference in weight represents the water soluble ash value. The percentage of water soluble ash was found to be 7.15. (See Table No. 2)

Table 2: percentage of ash values

Sr. No.	Analyzed parameters	Observation in (% w/w)
1	Total ash value	9.66
2	Acid insoluble ash value	0.68
3	Acid soluble ash value	7.15

Determination of extractive values:

Determination of extractive value is useful for obtaining superficial idea about the nature of chemical constituent present. Hence it is important to use the solvent which can able to dissolve appropriate quantity of desired substance.

Determination of Alcohol Soluble Extractive Value:
About 10gm of the air-dried coarse powder of *Soymida febrifuga* leaves was macerated with 100ml of 90% ethanol in a closed flask for 24 hours shaking frequently during the first 6 hours and allowed to stand for 18 hours. Thereafter, it was filtered rapidly. 25ml of the filtrate was evaporated to dryness in a tarred flat bottom shallow dish, dried at 105^0C and weighed. The percentage of ethanol soluble extractive value was found to be 27.86. (See Table No. 3)

Determination of Water Soluble Extractive Value:
Powdered *Soymida febrifuga* leaves (10gm) were weighed accurately and macerated with 100ml of water in a closed flask for 24 hours. It was shaken frequently during the first 6 hours and allowed to stand. After 18 hours it was filtered rapidly. Then 25ml of the filtrate was evaporated to dryness in a tarred flat-bottom shallow dish, dried at 105^0C and weighed. The percentage of water soluble extractive was 34.16.

Table 3: percentage of extractive values

Sr. No.	Analyzed parameters	Observation in (% w/w)
1	Alcohol soluble extractive value	27.86
2	Water Soluble Extractive Value	34.16
3	Loss on drying	3.34

IV. CONCLUSION

In this study the Fluorescence behavior of the plant material in different solvents were observed using visible, short UV (254nm) and long UV (365 nm) light. The result was analyzed to detect the occurrence of phytoconstituents along with colour changes. By observing the different colour of powder crude sample in different light region indicate the good quality sample and it can be used for further process.
The study of physicochemical analysis such as loss on drying, ash value, water and alcohol soluble extractive values were checked quantitatively. The maximum percentage of acid soluble ash value indicates the presence of more amount of natural calcium oxalate crystal in the present sample. It is observed that water soluble extractive value was found more than alcohol soluble extractive value.
For exploring traditional medicines and to investigate their scientific applications an endemic medicinal plant Soymida febrifuga Adr. Juss which has been used as a traditional folklore medicine. Proper investigations of the phytochemicals will make this plant species a special wonder in the world of medicines.

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