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Preliminary Phytochemical Analysis of Stem bark of *Asoka* – *Saraca asoca* (Roxb.) de Wilde

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ABSTRACT

Asoka - *Saracaasoca* (Roxb.) de Wilde is a well-known drug for the herbal industry. Even though various parts of this plant owe numerous pharmacological actions, its classical officinal part is stem bark. Due to over use and irrational collection practices the stem bark of this drug has been severely adulterated in the drug market. In Ayurvedic classics, the stem bark, are proposed to be collected during *Saratritu* (autumn season). The drug material to conduct the study was collected during the very same period. A lot of studies have been published about the phytochemistry of this drug, but none of them strictly followed this type of collection practices. This emphasizes the uniqueness of present work. Physicochemical parameters such as total ash, acid insoluble ash, water insoluble ash, moisture content, fibre content, tannin content, phenol content of the sample of test drug are estimated and found to be similar with that of the description in API. Sugar content in the drug is very trace, so as to quantitatively estimate the total and reducing sugar. The prepared *kashaya* was slight acidic in nature, by using the digital pH meter and it was found to be 6.56. The extractive values such as cold alcohol soluble, hot alcohol soluble, cold water soluble and hot water-soluble extractives of the drug sample were estimated. The observed values were found to be within the range as that of API. This work tries to merge up the ancient wisdom with modern techniques of phytochemistry.

KEYWORDS

Asoka, Saracaasoca (roxb.) De wilde, Powder, Stem bark, Phytochemical analysis

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INTRODUCTION

In *Ayurveda* specific time is mentioned for the collection of different parts of plants. This explains the keen idea of *Acharya*'s about the active principles in each useful part. The *sakha* (stem) and *patra* (leaf) are supposed to be collected during *varsha* (rainy) or *vasantha* (spring) *ritu*, *moolam (*root) must be collected during *greeshma* (summer) or *sisira* (winter) *ritu*,twak (bark),*kanda* (rhizomes) and *ksheera* (latex) should be collected during *sarat* (autumn) *ritu*, *saara* (heart wood) during *hemantaritu* and *pushpa*(flowers) and *phala* (fruits) as per the availability[1]. The stem bark collected during the specific season possess the phytoconstituents at its peak. In the present study, drug has been collected during prescribed season and phytochemical analysis has been performed.

MATERIALS AND METHODS

Materials of Phytochemical analysis

Collection of the test drug

The drug, *Asoka- Saracaasoca (*Roxb.) de Wilde.was collected during *Saratritu*, (autumn season) from its natural habitat of Perumbavur, Ernakulam district.Sample was pharmacognostically identified in thePharmacognosy Lab, Department of *Dravyagunavijnanam*, Government Ayurveda College, Tripunithura. Collected samples were washed with water thoroughly to remove physical impurities like soil, mud etc. and shade dried, powdered and kept in airtight containers.The phytochemical analysis was done at Drug Standardization Unit of Department of *Dravyagunavijnanam*, Government Ayurveda College, Tripunithura.

Reagents

Concentrated and dilute Hydrochloric acid, Xylene, Concentrated and dilute sulphuric acid,Concentrated and dilute Nitric acid, Sodium hydroxide solution, Lead acetate solution, Sodium oxalate, Potassium permanganate($KMNO_4$) solution, Anhydrous Sodium carbonate, Petroleum ether, Cyclohexane, Acetone, Alcohol, Fehling's Solution A&B, Chloroform water, Dragendroff's reagent, Mayer's reagent, Wagner's reagent, Neutral ferric chloride, Magnesium ribbon, Methylene blue reagent, Sodium bicarbonate solution and Copper Sulphate, Catechol, Folincio catechu phenol reagent.

Apparatus

Silica crucible, Round bottom flask, Dean and stark's apparatus, Clevenger's apparatus, Soxhlet apparatus, Water condensers, Buchner funnel, Hot air oven, Muffle furnace, Bunsen burner, Heating mantle G4, crucible, glass beakers, petri

dishes, standard flask, measuring jars, conical flask, funnel, glass rods, watch glass, burettes, pipettes, shaker, centrifuge etc.

Procedure:

The following parameters have been analysed. It was done as per the SOP published in API.

1. Determination of the physicochemical parameters

i.Determination of Foreign matter

ii.Determination of Total ash

iii.Determination of Acid insoluble ash

iv.Determination of Water insoluble ash

v.Determination of Moisture content

vi.Determination of Volatile oil content

vii.Determination of Fiber content

viii.Estimation of Tannin (Indigo Carmine method)

ix.Determination of Sugar content

x. Estimation of Phenol (Bray and Thorpe method) Table 1

Table 1 Observations of absorbance of sample and test solutions in the estimation of phenol content

Powder of stem bark of *Asoka (Saracaasoca* (Roxb). de Wilde.	
Solution	**Absorbance**
S 1	0.461
S 2	0.580
S 3	0.680
S 4	0.529
S 5	0.536
Sample blank	0.826
T 1	0.312
T 2	1.042
T 3	2.501

xi.Qualitative estimation of pH of the kashaya of stem bark of Asoka – Saraca asoca(Roxb). de Wilde.

*xii.Quantitative Estimation of pH ofkashaya*of stem bark of *Asoka – Saracaasoca* (Roxb). de Wilde.

2. **Determination of Extractive values**

Alcohol soluble extractives

Mainly represent the percentage of organic plant constituents such as alkaloids, phenols, flavonoids, sugars, volatile oils, resins, steroids, glycosides present in the alcoholic extract of drug.

i. Cold alcohol soluble extractives

ii. Hot alcohol soluble extractives

Water soluble extractives

Mainly represent the percentage of organic plant constituents such as alkaloids, phenols, flavonoids, sugars, volatile oils, resins, steroids, glycosides present in the alcoholic extract of drug.

i. Cold water-soluble extractives

ii. Hot water-soluble extractives

3. Determination of the phytochemical constituents

Qualitative analysis of crude drugs

1. Alkaloids
2. Flavonoids
3. Saponins
4. Carbohydrates
5. Proteins
6. Phenols
7. Steroids
8. Tannins

Qualitative analysis of ash

a) Acid radicals: Carbonates, Phosphates, Chlorides and Sulphides were analyzed.

b) Basic radicals: Potassium was analyzed.

RESULTS AND DISCUSSION

1. **Determination of physico-chemical parameters** Table 2

Table 2 Physico-chemical parameters of powder of stem bark of *Asoka – Saracaasoca* (Roxb.) de Wilde

Sl. No.	Parameters	Value
1	**Foreign matter**	Nil
2	**Total ash**	8.5%
3	**Acid Insoluble Ash**	0.05%
4	**Water Insoluble Ash**	7.45%
5	**Moisture Content**	6.6%
6	**Volatile oil**	Nil
7	**Fiber**	43.2%
8	**Tannin Content**	71.1%
9	**Total sugar**	Very trace amount, so unable to detect quantitatively
10	**Reducing sugar**	
11	**Phenol**	60.44 μg/g
12	**pH**	6.56

The detailed phytochemical analysis was carried out to determine the quality and purity of the drug. Physicochemical parameters such as total ash, acid insoluble ash, water insoluble ash, moisture content, fibre content, tannin content, phenol content of the sample of test drug are estimated and are found to be similar with that of the description in API. Sugar content in the drug is very trace, so as to quantitatively estimate the total and reducing sugar.

Qualitative and quantitative estimation of pH of the *kashaya* of stem bark of *Asoka – Saracaasoca* (Roxb.) de Wilde has been analysed. The prepared *kashaya* turns the blue litmus slightly to red. This indicates the slight acidic nature of *kashaya*. Also, pH was determined using the digital pH meter and it is found to be 6.56. This result reveals that the *kashaya* of stem bark of *Asoka – Saracaasoca* (Roxb.) de Wilde has slight acidic nature. There was no previous reference regarding the pH of *kashaya* of test drug.

2. **Determination of extractive values** Table 3

Table:3 - Determination of extractive values of powder of stem bark of *Asoka – Saracaasoca* (Roxb.) de Wilde.

Table 3 Determination of extractive values of powder of stem bark of *Asoka – Saracaasoca* (Roxb.) de Wilde.

Sl. No	Type of extractive	Values
1	**Cold alcohol soluble**	13.2%
2	**Hot alcohol soluble**	14.4%
3	**Cold water soluble**	15.48%
4	**Hot water soluble**	21.6%

The extractive values such as cold alcohol soluble, hot alcohol soluble, cold water soluble and hot water-soluble extractives of the drug sample were estimated. The observed values for water soluble extractives were found to be within the range as that of API. But there is a variation in alcohol soluble extractive values, as the solvent used for extraction is iso-propyl

alcohol instead of ethyl alcohol mentioned in API.

3. **Qualitative analysis of powder of stem bark of *Asoka- Saracaasoca* (Roxb.) de Wilde** Table 4

Table 4 Results of qualitative analysis of powder of stem bark of *Asoka- Saracaasoca* (Roxb.) de Wilde

Test	Present/ Absent
Alkaloids	
Dragendroff"s test	+
Meyer's test	-
Flavonoids	+
Saponins	++
Carbohydrates	
Fehling's test	+
Benedict's test	+
Proteins	+
Phenols	
Ferric chloride test	+
Lead acetate test	+
Steroids	+
Tannins	
Ferric chloride test	+
Lead acetate test	+

On analysing the phytochemical constituents present in the crude drug using alcoholic and chloroform extracts, the drug revealed the presence of alkaloids, flavonoids, saponins, carbohydrates, proteins, phenols, steroids, and tannins.

4. Qualitative analysis of ash

Table 5

The qualitative analysis of ash revealed the presence of three acid radicals, carbonates chlorides and sulphates and it has no basic radical.

CONCLUSION

Preliminary phytochemical analysis of the test drugs including analysis of foreign matter, total ash, acid insoluble ash, water insoluble ash, moisture content, volatile-oil, fibre content, tannin, sugar content, water solubleextractive and alcohol soluble extractives were done. Also, qualitative analysis of the crude powder and powdered ash was conducted. Obtained values are similar to those present in API. Some additional tests are performed other than API standards to affirm the purity and quality of study drug. This article will provide an authentic information about the preliminary phytochemicals in stem bark of *Asoka – Saracaasoca* (Roxb.) de Wilde.

Table 5 Qualitative analysis of ash obtained from powder of stem bark of *Asoka – Saracaasoca* (Roxb.) de Wilde.

Sl. No.	Experiment	Present/Absent
Acid radicals		
1.	**Carbonate**	+
2.	**Phosphate**	-
3.	**Chloride**	+
4.	**Sulphate**	+
Basic radicals		
5.	**Potassium**	-

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REFERENCES

1. Sharma R K and Dash B. CharakaSamhita: English translation and critical exposition based on Chakrapanidatta's Ayurvedadipika, Chowkamba Sanskrit Series, Varanasi, 2014 Vol 2: p.100.