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## COMPARISON OF THE PHYSICOCHEMICAL ANALYSIS AND PHYTOCHEMICAL SCREENING OF LEAVES AND SEEDS OF KAT- KARANJ (*Caesalpinia bonduc*)

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### ABSTRACT

*Caesalpinia bonduc* (*Caesalpiniaceae*), commonly known as Kat-karanj, is well known for its medicinal value in Indian Ayurveda. However, more experimental data need to be collected in order to scientifically prove its efficacy. The present study was planned to compare the physicochemical analysis and phytochemical screening of leaves and seeds of *C. bonduc*. Both leaves and seeds of plant are medicinally important and used as anti-inflammatory, antihelminthic, antidiabetic and antioxidant. Six samples of each extract (methanol and ethanol) of leaves and seeds were standardized according to the methods recommended by the World Health Organization and standard laboratory procedures. The percentage of total ash, acid insoluble ash and water soluble ash (7.29%, 0.41% & 4.65%) were found in leaves when compared with seeds (4.20%, 0.26% & 0.92%). Percentage of extractive value of water soluble and alcohol soluble (4.65% & 5.68%) in leaves were slightly higher than seeds (0.92% & 4.40%) and percentage of moisture content was found in seeds slightly lower than leaves. Preliminary phytochemical screening of these plant materials revealed that presence of alkaloids, saponins, flavonoids, steroids, phytosterols and carbohydrates in methanol and ethanol extracts. This comparative information provides immense potential for studying their activities for various disease conditions, both in pre-clinical and clinical stages, which lead to the preparation of useful pharmaceutical products.

**Key Words:** Physicochemical; Adulteration; Extractable matter; Immense potential; Pharmaceutical products.

### INTRODUCTION

*Caesalpinia bonduc* is a wild highly thorny shrub, belonging to the family *Caesalpiniaceae*, is a prickly shrub widely distributed all over the world specially India, Sri Lanka and Andaman and Nicobar Islands, in India specially found in tropical regions, near the sea-coasts, especially Bengal, Bihar, Mumbai, Rajasthan and whole of Southern India (Singh *et al.*, 2012; Khare, 2007; Asolkar *et al.*, 2000; White, 2005). Generally found up to an altitude of 1,000 m in Himalaya and wild throughout the plains on

waste lands or coastal areas of India. It is also found in deltaic region of western, eastern and southern India (WOI, 1992). Found particularly the seacoast throughout the hotter parts of India, Burma and Sri Lanka (Kapoor, 2010).

The plant grows all over in India, grows in shade as well as in open. It is a free-flowering and free-fruited plant without periodicity (Hou *et al.*, 1996). The plant can thrive well on sea shores (Alvin *et al.*, 2011). It is a large, scandent, prickly shrub and commonly known as fever nut (Kat-karanj) among the local population (Fig.1). The bark is dark brown with numerous recurved branchlets are glossy, occasionally lenticellate, armed with 4-5 mm long recurved prickles and leaves with prickles. The pinnae are 8-3 pairs; leaflets are 9- {2 pairs per pinnae, which as

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membrane truncate}. The flowers are small, yellowish with a red dot at the base or red veined, in axillary and racemes. The pods are short beaked, 1-4 seeded and often constricted. The seeds are dark brown and hard and roots of this plant is dark brown colour (Handa *et al.*, 1996; Gopal, 1992; Kirtikar and Basu, 1993; Sharma *et al.*, 1972). Leaves are with large, leafy, branched, 30-60 cm long and Seeds consist of a thick, glossy, brittle shell with a yellowish white bitter fatty kernel (Parushothaman *et al.*, 2007).

The plant has been reported to possess several activities and also revealed the presence of alkaloids, flavonoids, glycosides, saponins, tannins and triterpenoids (Gaur *et al.*, 2008; Gupta *et al.*, 2005), flavonoids, triterpenoids, diterpenoids, and steroids (Peter *et al.*, 1997; Lyder *et al.*, 1998; Simin *et al.*, 2000). All parts of the plant have medicinal properties so it is a very valuable medicinal plant, which is utilized in traditional system of medicine to treat various ailments with respect to heal mankind (Kirtikar and Basu, 1988). The leaves, seed kernels, seed oil, flowers and fruits are used in India for the treatment of various diseases like anti-inflammatory (Jethmalani *et al.*, 1966; Shukla *et al.*, 2010), antihelminthic, antimalarial (Jain *et al.*, 1992), antitumour (Gupta *et al.*, 2005), anticomplementary (Oh *et al.*, 1998), anticonvulsant (Baek *et al.*, 2000), adaptogenic (Kannur *et al.*, 2006), antidiabetic (Parameshwar *et al.*, 2007) and antioxidant (Gupta *et al.*, 2004), aldose reductase inhibition (Li WL *et al.*, 2004) and also used as nootropic or memory enhance in immune system (Chakrabarti *et al.*, 2005; Nadkarni, 1989).

The *C. bonduc* leaves contain flavonoids, tritenpenoids, ditnenpenoids and steroids (Gupta *et al.*, 2003). The seeds of *C. bonduc* contain bitter principles phytosternin, bonducin, phytosterols and starch. Neogi and Nayak (1958) obtained resinous bitter principles from Kernel of the seeds (Raghunathan and Mitra, 1982). The phytochemical studies on the various extracts of seed revealed the presence of several bioactive molecules that include oils, sterols, saponins, alkaloids, glycosides, phenols, tannins, flavonoids and resins (Shukla *et al.*, 2011) and flavonoids, triterpenoids and steroids (Aswar and Kuchekar, 2011).

The leaves of this plant are traditionally used for the treatment of tumor, Inflammation and liver disorders (Kirtikar and Basu, 1993; WOI, 1950) and possessed relaxant actions on bronchial muscle and smooth muscles of intestine and uterus. It was found to have hypertensive action, which appears to be due to the direct vasodilator action (Gayaraja *et al.*, 1977). It has also been recognized for such multiple therapeutic properties as antipyretic, and antibacterial (Neogi and Nayak, 1958), anti-anaphylactic, antidiarrheal and antiviral (Dhar *et al.*, 1968), anti-asthmatic (Gayaraja *et al.*, 1978), anti-hyperglycaemic (Rad *et al.*, 1994), abortifacient (Datte *et al.*, 1998), antidiabetic activity (Kundul *et al.*, 2012), anthelmintic

(Karthi *et al.*, 2011), hepatoprotective (Rajesh, 2011), anti-inflammatory, analgesic and antipyretic activity (Gupta *et al.*, 2003). The leaves were also recognized for the protective effect and development of better therapeutic agents for liver, kidney, and other organs dysfunctions and diseases (Noorani *et al.*, 2011).

The seeds of *C. bonduc* are found to have adaptogenic, antistress and hyperlipidaemic (Kannur *et al.*, 2006), anxiolytic (Rao *et al.*, 2008), hypersensitivity, anti-inflammatory and immunostimulatory (Shukla *et al.*, 2010) activity. The seed extracts were showed predominantly significant activity on *in-vitro* human neutrophils in all parameters as compared to other extracts of the seed indicating the possible immune stimulant effect (Mathapati *et al.*, 2010).

*C. bonduc* extract (Cebo) affects gallamine-induced relaxation in rat tibial muscle contractility was reported via measurement of isometric-tension-anesthetized, it was concluded that, Cebo stimulates the muscle contractile activity, an effect which may be due to an activation of the cholinergic mechanism (Datte *et al.*, 2004). Two new cassane diterpenes namely, neocaesalpinins C and D were isolated from the seeds of *C. bonduc*, and structures were elucidated on the basis of the spectroscopic evidence. These compounds are characterized by the presence of the alpha, beta-butarnolide moiety (Kinoshita, 2000).

The aim of comparative study of methanol and ethanol extract of leaves and seeds were identifies their activities for various disease conditions, both in pre-clinical and clinical stages, and search the new research areas for development of better therapeutic agents for the prevention of auto-immune diseases and used in the traditional system of medicine.

## MATERIAL AND METHODS

### Collection of plant materials

The leaves and seeds of *Caesalpinia bonduc* (Caesalpinaceae) were collected in the month of April and May from Campus of Jayoti Vidyapeeth Women's University, Village- Jharna, Jaipur, Rajasthan, India and were authenticated by the taxonomist of Herbarium, Department of Botany, University of Rajasthan, India bearing herbarium reference number RUBL211318.

### Preparation of powder

The collected leaves and seeds were washed; shade dried and pulverized with mechanical pulverizer for size reduction. It was passed through mesh (size 40) and the fine powder was stored in air tight containers and used for the experiment and preparation of extract.

### Determination of Ash Value (Kokate, 2010)

#### Determination of total ash value

Accurately weighted 5 gms of powdered leaves and seeds was taken in a dried silica crucible. It was

incinerated at temperature 450°C, until free from carbon and then cooled. The weight of total ash was taken and the percentage of it was calculated with the reference of the air dried sample.

#### **Determination of acid insoluble ash value**

The total ash obtained was boiled for 5 mins with 25 ml of 2N HCL, filtered and the insoluble matter was collected on ash less filter paper. Then it was washed with hot water, ignited in tarred crucible cooled and the residue obtained was weighted. Finally the percentage of acid insoluble ash was calculated with reference of the air dried drug.

#### **Determination of water soluble ash value**

The total ash obtained was boiled with 25 ml of water for few mins. The insoluble matter was collected on ash less filter paper, washed with hot water and ignited for 15 mins at temperature not exceeding 450°C. The difference in weight represents the water soluble ash. The percentage of water soluble ash was calculated with the reference to the air dried drug. Each determination was carried out three times and the average value was taken.

#### **Determination of Extractive Value**

##### **Determination of alcohol and water soluble extractive value**

20 gms of air dried, coarsely powdered leaves and seeds was macerated with 100 ml of alcohol (90%) in closed flask for 24 hrs, shaking frequently during the first 6 hrs and was allowed to stand for 18 hrs. Then it was filtered rapidly and precautions were taken against loss of alcohol. 25 ml of the filtrate was evaporated to dryness in a tarred flat bottomed shallow dish, dried at 105°C and weighted. The percentage of alcohol soluble extracts were calculated with reference to the air dried drug. The procedure followed as above using chloroform water instead of alcohol (Khandelwal, 2011; Trease and Evans, 2002).

#### **Determination of moisture content**

Accurately weighed 5 gms of powdered leaves and seeds was taken in a china dish. It was kept for 30 mins. In a hot air oven which was adjusted to 105-110°C. The percentage of moisture content was then calculated with reference to the air dried drug at different times (Khandelwal, 2011).

#### **Fluorescence analysis**

Fluorescence characters of dried powdered leaves and seeds were studied both in Visible light and UV lights. The fluorescence analysis of drug powder was also studied by treating the acids and alkalis (OECD, 2001).

#### **Behavior analysis**

The behavior analysis was adopted for the study

of behavior pattern of powdered leaves and seeds and quantity taken was few gms. Materials were subjected to react with different solvents. The solvents used are acetic acid, conc. sulphuric acid, conc. nitric acid, conc. Hydrochloric acid, ferric chloride solution (neutral), 5% iodine solution, ammonia solution, 1N sodium hydroxide solution, picric acid, ethanol and methanol (Khandelwal, 2011).

#### **Extraction of the drug**

The sequential extraction of leaves and seed powder carried out using solvents – Ethanol and Methanol. 100 gms of dried leaves and seeds powder was taken and extracted with sufficient quantity of Ethanol and Methanol (60-80°C) using Soxhlet apparatus for 48 hrs at 60-80°C. The extracts were filtered in each step, concentrated, and the solvent was removed by rotary evaporator. The extracts were dried over desiccator and the residues were weighted. The extract was concentrated and stored in refrigerator for further analysis (Marsha *et al.*, 2002; Taesotikul *et al.*, 2003).

#### **Preliminary phytochemical screening** (Khandelwal, 2011)

The powdered leaves and seeds was subjected to systematic phytochemical screening by successively extracting them in ethanol and methanol and testing for the presence of chemical constituents.

#### **Qualitative chemical examination of extracts** (Khandelwal, 2011; Trease and Evans, 2002)

The sequential extraction of powdered leaves and seeds was carried out using ethanol and methanol by soxhlet extraction method. All the obtained from solvent extraction then subjected to qualitative chemical analysis to detect the chemical constituents present in them.

#### **Detection of alkaloids**

Extracts were dissolved individually in dilute hydrochloric acid and filtered. The filtrates were tested carefully with alkaloid reagents.

- a) Mayer's Test: Filtrates were treated with Mayer's reagent (potassium mercuric iodide). The formation of a yellow cream precipitate indicated the presence of alkaloids.
- b) Wagner's Test: Filtrates were treated with Wagner's reagent (iodine in potassium iodide) and observed. Formation of brown or reddish brown precipitate indicated the presence of alkaloids.
- c) Dragendorff's Test: Filtrates were treated with Dragendorff's reagent (solution of potassium bismuth iodide). Formation of red precipitate indicated the presence of alkaloids.
- d) Hager's Test: Filtrates were treated with Hager's reagent (saturated picric acid solution). Formation of yellow colored precipitate indicated the presence of alkaloids.

**Detection of carbohydrates**

Extracts were dissolved individually in 5 ml of distilled water and filtered. The filtrates were used to test the presence of carbohydrates.

- a) Molisch's Test: Filtrates were treated with 2 drops of alcoholic  $\alpha$ -naphthol solution in a test tube and 2 ml concentrated sulphuric acid was added carefully along the sides of the test tube. Formation of violet ring at the junction indicated the presence of carbohydrates.
- b) Benedict's test: Filtrates were treated with Benedict's reagent and heated on water bath. Formation of an orange red precipitate indicated the presence of reducing sugars.
- c) Fehling's Test: Filtrates were hydrolyzed with dilute hydrochloric acid, neutralized with alkali and heated with Fehling's A and B solution. A red precipitate was formed which indicated the presence of carbohydrates.
- d) Barfoed's test: Filtrates were treated with Barfoed's reagent and heated on water bath. Formation of an orange red precipitate indicated the presence of reducing sugars.

**Detection of proteins and amino acids**

- a) Millons Test: The extracts were treated with 2 ml of Millons reagent. The formation of white precipitate, which turned to red upon heating, indicated the presence of proteins and amino acids.
- b) Biuret Test: The extracts were treated with 1 ml of 10% sodium hydroxide solution and heated. A drop of 0.7% copper sulphate solution to the above mixtures was added. The formation of purplish violet color indicated the presence of proteins.
- c) Ninhydrin Test: To the extract, 0.25% ninhydrin reagent was added and boiled for few minutes. Formation of blue color indicated presence of amino acid.

**Detection of glycosides**

Extracts were hydrolyzed with dilute hydrochloric acid and the hydrolysate was subjected to glycosides tests.

- a) Modified Borntrager's Test: The extracts were treated with ferric chloride solution and heated on boiling water bath for about 5 mins. The mixture was cooled and shaken with equal volume of benzene. The benzene layer was separated and treated with half of its volume of ammonia solution. The formation of rose pink or cherry red color in the ammoniacal layer indicated the presence of glycoside.
- b) Liebermann's Test: The extracts were treated with chloroform and filtered. The filtrates were treated with few drops of acetic anhydride, boiled and cooled. Concentrated sulphuric acid was added through the sides of the test tube. The formation of brown or pink colored rings at the junction confirmed the presence of glycosides respectively.
- c) Keller Killani Test: 0.5g of dried extract was dissolved in 2 ml of glacial acetic acid containing one drop of ferric chloride solutions. This was then laid with 1 ml of concentrated sulphuric acid. A brown ring obtained at the presence of glycosides.

**Detection of phenolic compounds, tannins and flavonoids**

- a) Ferric Chloride Test: The extract was treated with few drops of neutral ferric chloride solution (5%). The formation of bluish black color indicated the presence of phenolic compound and tannins.
- b) Lead Acetate Test: The extracts were treated with few drops of 10% lead acetate solution. The formation of yellow precipitate confirmed the presence of flavonoids.
- c) Alkaline Reagent Test: The extract was treated with few drops of sodium hydroxide separately. Formation of intense yellow color which turned colorless on addition of few drops of dilute acid indicated the presence of flavonoids.

**Detection of saponins**

- a) Froth's Test: The extracts (ethanolic and methanolic) were diluted with 20 ml of distilled water separately and further shaken for 15 mins in a graduated cylinder. A layer of foam measuring about 1 cm was formed which indicated the presence of saponins.

**Detection of phytosterols**

- a) Liebermann-Burchard's Test: The extracts were treated with chloroform and filtered. The filtrates were treated with few drops of acetic anhydride, boiled and cooled concentrated sulphuric acid was added through the sides of the test tube. The formation of brown colored ring at the junction confirmed the presence of steroids or triterpenoids.
- b) Copper Acetate Test: To the test sample copper acetate solution was added and observed for the formation of emerald green color.

**Detection of fixed oils and fats**

- a) Stain Test: Small quantity of extracts was pressed between two filter papers separately. An oily stain on filter paper indicated the presence of fixed oil.
- b) Soap Test: The extracts were heated on water bath with 0.5N alcoholic potassium hydroxide solutions. Formation of soap indicated the presence of fixed oils and fats.

**RESULTS AND DISCUSSION****Physiochemical evaluation**

Different physiochemical values such as ash values (total ash, acid-insoluble ash & water soluble ash), extractive values (water & alcohol soluble) and moisture content of leaves and seeds of *C. bonduc* were determined. The analysis reveals the highest percentage of extraction in water in case of leaves and alcohol in case of seeds. The results are given in Table 1-3.

**Fluorescence analysis**

Chemical tests of powder drug with different reagents were studied in UV 254 nm, UV 366 nm and visible light. The powder drug shows same fluorescence in

UV 254 nm as in Visible light. The results are presented in Table 4 respectively.

#### **Behavior analysis**

The behavior analysis was adopted for the study of behavior pattern of powdered leaves and seeds of *C. bonduc*. Materials were subjected to react with different solvents. The powder drug shows maximum same behavior in different reagents. The result which is been reported in table 5.

#### **Preliminary phytochemical screening**

The successive solvent extraction procedure was adopted for the preparation of extracts of *C. bonduc* leaves

and seeds and quantity was taken 50 gms and 25 gms. The materials were subjected to extraction with solvents. The solvents used are ethanol and methanol. The results are presented in Table 6 & 7 respectively.

#### **Qualitative chemical analysis of extracts**

The qualitative chemical analysis was carried out using the extracts for ethanol and methanol as per method described by Trease and Evans. The extracts were subjected to preliminary phytochemical investigation for detection of alkaloids, carbohydrates, proteins and amino acids, glycosides, phenol, tannins, flavonoids, sponins, phytosterols, fixed oil and fats. Presence and absence of different phyto-constituents are presented in Table 8.

**Table 1. Ash value determination of *C. bonduc***

Parameters	Leaves [ % Yield (w/w)]	Seeds [% Yield (w/w)]
Total Ash	7.79	4.20
Acid Insoluble	0.41	0.26
Water Soluble	4.65	0.92

**Table 2. Extractive value determination of *C. bonduc***

Sample	Water soluble extractive value % Yield (w/w)	Alcohol soluble extractive value % Yield (w/w)
Leaves	6.45	5.68
Seeds	4.25	4.40

**Table 3. Moisture content determination of *C. bonduc***

S.R.No.	Time (mins)	Leaves [% (w/w)]	Seeds [% (w/w)]
1.	30	9.53	8.07
2.	45	7.06	5.66
3.	60	6.39	5.38
4.	75	6.15	5.06
5.	90	4.50	4.08

**Table 4. Fluorescence analysis determination of *C. bonduc***

Reagents	UV Short (254 nm)		UV Long (366 nm)		Visible Light	
	Leaves	Seeds	Leaves	Seeds	Leaves	Seeds
Powder as Such	Green	Cream	No Fluorence	Light Brown	Green	Cream
Powder with (1N) NaOH Sol.	Dark Green	Dark Brown	No Fluorence	No Fluorence	Dark Green	Cream
Powder with Picric Acid	Dark Green	Light Yellow	No Fluorence	No Fluorence	Dark Green	Yellow
Powder with Acetic Acid	Dark Green	Cream	No Fluorence	No Fluorence	Dark Green	Cream
Powder with (1N) HCl Sol.	Dark Green	Cream	No Fluorence	No Fluorence	Dark Green	Cream
Powder with 5% feCl3 sol.	Dark Green	Dark Brown	No Fluorence	No Fluorence	Dark Green	Brown
Powder with HNO3 & NH3 sol.	Dark Brown	Light Yellow	No Fluorence	No Fluorence	Brown	Dark Cream
Powder with 1N NaOH in Methanol	Dark Green	Light Cream	No Fluorence	No Fluorence	Green	LightBrown
Powder with 50% HNO3 sol.	Dark Green	Dark Brown	No Fluorence	No Fluorence	Brown	Dark Brown

Powder with Methanol	Green	Cream	No Fluorence	No Fluorence	Green	Cream
Powder with Ethanol	Dark Green	Light Cream	No Fluorence	No Fluorence	Green	Cream

**Table 5. Behavior analysis of *C. bonduc* with different chemical reagents**

Reagent	Observation	
	Leaves	Seeds
Powder as Such	Green	Cream
Powder with Acetic Acid	Green	Light Brown
Powder with Conc. Sulphuric Acid	Light Black	Brown
Powder with Conc. Nitric Acid	Brown	Light Brown
Powder with conc. Hydrochloric Acid	Dark Green	Brown
Powder with Ferric chloride Solution	Dark Green	Brown
Powder with 5% Iodine Solution	Green	Cream
Powder with Ammonia Solution	Green	Yellowish white
Powder with Aqueous Sodium hydroxide Solution (1N)	Green	Light Brown
Powder with picric Acid Solution	Green	Yellow
Powder with Ethanol	Green	Cream
Powder with Methanol	Green	Cream

**Table 6. Phytochemical screening of Leaves powder of *C. bonduc***

Serial no.	Solvent used	Color and consistency
1.	Ethanol	Dark green, highly viscous and non-sticky
2.	Methanol	Light green, viscous and non-sticky

**Table 7. Phytochemical screening of Seeds powder of *C. bonduc***

Serial no.	Solvent used	Color and consistency
1.	Ethanol	Light brown and non-sticky
2.	Methanol	Light brown, viscous and non-sticky

**Table 8. Qualitative chemical analysis of Ethanolic and Methanolic extracts of *C. bonduc***

Tests	Ethanolic leave extract	Methanolic leave extract	Ethanolic seed extract	Methanolic seed extract
<b>• ALKALOIDS</b>				
I. Mayer's test	+	+	+	-
II. Dragendroff's Test	+	+	-	-
III. Wagner's Test	+	+	+	-
IV. Hager's Test	-	-	-	-
<b>• CARBOHYDRATE</b>				
I. Molisch's Test	-	-	+	+
II. Benedict's Test	-	-	-	+
III. Fehling's Test	+	+	+	+
IV. Barfoed's Test	-	-	-	-
<b>• PROTEIN &amp; AMINO ACIDS</b>				
I. Million's Test	-	-	-	-
II. Biruet Test	-	-	-	-
III. Ninhydrin Test	-	+	-	-
<b>• GLYCOSIDES</b>				
I. Modified- Borntrger's Test	+	-	+	-
II. Libermann's Test	-	-	-	+
III. Killer-kilani Test	-	+	+	-



<ul style="list-style-type: none"> <li><b>PHENOLS, TANNINS &amp; FLAVONOIDS</b></li> </ul>				
I.	Ferric Chloride test	+	+	-
II.	Lead Acetate Test	+	+	+
I.	Alkaline Reagent Test	+	-	+
<ul style="list-style-type: none"> <li><b>SPONINS</b></li> </ul>				
I.	Forth Test	+	+	-
<ul style="list-style-type: none"> <li><b>PHYTOSTEROLS</b></li> </ul>				
	Liebermann-Burchard's Test	-	-	-
II.	Copper Acetate Test	+	+	-
<ul style="list-style-type: none"> <li><b>FIXED OIL AND FATS</b></li> </ul>				
I.	Stain Test	-	+	+
II.	Soap Test	-	-	-

- Each value is an average of three determinations
- + = present; - = absent

Fig 1(a). Mother plant of *Caesalpinia Bonduc* (b) Leaves & (c) Seeds



## CONCLUSION

The physiochemical Parameters includes tests like Determination of Ash (total ash, acid insoluble ash and water soluble ash), Extractive value (water soluble and alcohol soluble), and Moisture content. Concentration of total ash and acid insoluble ash in each ingredient was less than the limit. The analysis reveals the highest percentage of extraction in water in case of leaves and alcohol in case of seeds. Moisture content of all the ingredients was less than 5%, so that it can prevent microbial growth and sticking problem in final processing of formulation. In the fluorescence analysis, the powder drug shows same

fluorescence in UV 254 nm as in Visible light. During behavior analysis, the powder drug shows maximum same behavior in different reagents. In the study of preliminary phytochemical screening, the ethanolic leaves and seeds extract shows presence of steroids, where as ethanolic and methanolic leave extracts shows alkaloids, phenol and phytosterols. Thus in Conclusion, after comparison the data suggested that both methanol and ethanol extract of leaves and seeds were consistent with various quality and purity parameters such as physiochemical parameter and chemical constituents present in them.

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