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Pharmacognostic and phytochemical evaluation of *Commiphora caudata* and *Commiphora wightii* bark

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Abstract
The present paper reports the pharmacognostic and phytochemical evaluation of *Commiphora caudata* and *Commiphora wightii* bark both plants are belongs to the family Burseraceae. *Commiphora caudata* plant is a smooth, small tree with a thick trunk and papery bark, mostly found in southern India, Sri Lanka. *Commiphora wightii* plant is a small tree indigenous to India, growing wild in the semi-arid states of Rajasthan, Gujarat, and Karnataka. The tree is typically grown as a shrub or small tree, reaching a maximum height of 4 m (13 ft), with thin papery bark. The branches are thorny. Macroscopic characteristics along with inflorescence characteristics, consistency, percentage yield of *Commiphora caudata* and *Commiphora wightii* bark were noted. Evaluation of active phytochemical constituents and Preliminary phytochemical studies of bark extracts of *Commiphora caudata* and *Commiphora wightii*. The bark of *Commiphora caudata* and *Commiphora wightii* revealed the presence of alkaloids, glycosides, tannins, coumarins, phytosterols, flavonoids, phenols, and saponins.

Keywords: *Commiphora caudata*, *Commiphora wightii*, pharmacognostic, phytochemical

Introduction

Commiphora caudata belongs to the family Cucurbitaceae. *Commiphora caudata* (Wight & Arn) is also known as hill-mango or green Commiphora. Fruiting & Flowering occurs since March to October, red bloom born in axillary cymes. *Commiphora caudata* (Wight &Arn) belongs to the family Burseraceae is circulating throughout the Srilanka, Western peninsula, and India. In Tamil, it is known as "Pachai kiluvai" and in Telugu its far properly known as "Konda mamidi" [1]. *Commiphora wightii* (Arnott) Bhandari belonging to the Family, Burseraceae. The plant is commonly known as guggul tree and is found in arid areas of India, Bangladesh, and Pakistan. In India, it is found in Rajasthan, Gujarat, Assam, Madhya Pradesh, and Karnataka. It is a small, bushy tree with thorny branches and produces a yellowish gum resin (guggulu) in small ducts located throughout its bark. The trees are tapped by making an incision on the bark. The resin, which flows out, is allowed to harden before it is collected [2, 3]. It is known by different names like guggula, guggul, guggal, gugar, and Indian bdelliu [4]. Commiphora genus of Burseraceae family comprises of more than 185 species [5, 6]. Among them many species have been reported with diverse medicinal potential. Various parts of the plant were described to possess various biological activities such as antiviral, antispasmodic, cytotoxic, hypothermic activity, anticomdogenesis effect, antioxidant and antiacne properties [7]. Commiphora cauadata roots shows the presence of alkaloids, amino acids, flavonoids, glycosides, proteins, reducing sugars, starch, steroids, tannins, terpenoids [8]. Though there is a traditional and experimental evidence to support various claims and benefits of these plants still it needs proper evaluation and exploitation [9]. *Commiphora caudata* is utilized in Ayurveda and Siddha traditional medicines. *Commiphora caudata* has hepatoprotective, febrifuge, antibacterial and antioxidant. The gum blended in with water is utilized as mouth wash to cure mouth ulcer and is utilized for wound healing and rheumatoid arthritis [10]. Anti arthritic activity [11], antispasmodic activity, cytotoxic activity and hypothermic activity [12], antioxidant and anti microbial activity [13], anti inflammatory activity [14], learning and memory enhancing activity [15], diabetic activity in HFD+STZ induced diabetic model [16], anti inflammatory activity [17], anti ulcer activity [18], anti diabetic activity in alloxan induced diabetic rats [19], anti-inflammatory, analgesic & anti-oxidant activity [20]. In Indian traditional system of medicine, guggulu has been used for thousands of years in the treatment of arthritis, inflammation, gout, rheumatism, obesity, and disorders of lipids metabolism [21]. Plants are significant to human being for his life. Plants are incessantly an ordinary source of medicine in the usage of traditional preparations. All plants phyla create official and illegal product of therapeutic significance. The antiquity of herbal medicine is as very old as human society [22, 23]. Medicinal plants contain physiologically active principles that over the years have been exploited in traditional medicine for the treatment of various ailments [25, 26, 27] reported that plants contain a wide variety of active principles. Phytochemicals are chemical compounds formed during the plants' normal metabolic processes and often referred to as "secondary metabolities" of which there are several classes including alkaloids, flavonoids, coumarins, glycosides, gums, polysaccharides, phenols, tannins, terpenes and terpenoids [27]. The qualitative and quantitative estimation of the phytochemical constituents of a medicinal plant is considered to be an important step in medicinal plant research [28]. Phytochemical progress has been aided enormously by the development of rapid and accurate methods of screening plants for particular chemicals [29]. There are several standard methods used for the phytochemical screening of medicinal plants. There are variety of phytoconstitutents like alkaloids, steroids, saponins [30], phenolics [31], flavonoids [32], saponins and cardiac glycosides [33] and tannins [34]. It is used in the Allopathic, Ayurvedic and Unani systems of medicines due to its anti-inflammatory, anti-rheumatic, hypocholesteremic

and anti-fertility activities [35] *Commiphora wightii* are known to contain chemical constituents belonging to different chemical groups, namely, alkaloids, glycosides, steroids, terpenoids, flavonoids, coumarins, tannins, and anthraquinones [36]. Therapeutic potential and medicinal use of *Commiphora caudata* in traditional system of medicine dates back to 3000 years ago. An extensive literature survey on phytochemistry of the genus Commiphora has revealed the presence of more than 300 secondary metabolitesIt is important to distinguish and determine the presence of major chemical groups employing simple chemical tests using various reagents. In the present study we performed the Pharmacognostic and phytochemical of *Commiphora caudata* and *Commiphora wightii*.

Material and methods

The healthy *Commiphora caudata* bark plant material was collected from Naigao village, Tq. Patoda, Dist. Beed, Maharashtra. These plants material (bark) were subjected to phytochemical analysis (qualitative) for the presence of important secondary metabolite compounds. The healthy *Commiphora wightii* bark plant material was collected from Therla village, Tq. Patoda, Dist. Beed, Maharashtra. These plants material (bark) were subjected to phytochemical analysis (qualitative) for the presence of important secondary metabolite compounds.

Collection and Authentication of specimen

The healthy *Commiphora caudata* bark plant specimens for the proposed study were collected from Naigao village, Tq. Patoda, Dist. Beed, Maharashtra. The specimens were identified and authenticated by Botanical Survey of India, Pune, Maharashtra, India (Ref. BSI/WRC/Iden. Cer./2023/0105230026729 Dt. 8th May, 2023). Authenticated by D.L. Shirodkar (Botanist, BSI, WRC, Pune). As well the healthy *Commiphora wightii* bark plant material was collected from Therla village, Tq. Patoda, Dist. Beed, Maharashtra. The specimens were identified and authenticated by Botanical Survey of India, Pune, Maharashtra, India (Ref. BSI/WRC/Iden. Cer./2023/0105230026729 Dt. 8th May, 2023). Authenticated by D.L. Shirodkar (Botanist, BSI, WRC, Pune).

Standardization of plant material

The quality control of herbal crude drug and bio-constituents is of paramount important for their acceptability in modern system of medicine. One of the major problems faced by user in industry is non-availability of rigid quality control profile for herbal raw material and their formulation with advanced of analytical technique and sophisticated instrument technology; it is possible to suggest a practicable quality assurance profile for a crude drug or its bioactive constituents. The action of the herb may be from a number of constituents and not from just one or two ingredients. Thus, the standardized preparation may omit some of the ingredients and to minimize the complex combination of the constituents.

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Preparation of plant extract

The bark of the collected plant material was shade dried in open air separately. Powder of the bark is obtained by grinding them mechanically. About 100 gm of each dried powder of the plant bark were soaked separately in 1000 ml of different solvents like petroleum ether, chloroform, acetone, ethanol, and water in conical flasks and then subjected to agitation on a rotary magnetic shaker for about 72 hours. After three days the plant extracts were subjected to filtration, filtered with No 42 whatman filter paper separately. Concentrated extracts were preserved in sterilized air tight labeled bottles and preserved in refrigerator at 4ÚC until required for further use. The extract was filtered under reduced pressure using rotary flash evaporator and subjected for further preliminary phytochemical tests. Different tests conducted for the identification of phytochemicals is adopted by using the methods described.

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Preparation of the extract

The fresh bark of the plant *Commiphora caudata* and *Commiphora wightii* (Arn.) were collected air-dried under shade under controlled conditions. The dried bark of the plants was coarsely powdered using a mechanical grinder. The powder was passed through sieve no.40 and stored in an

airtight container for extraction. About 500 g of coarsely powdered bark of *Commiphora caudata* and *Commiphora wightii* (Arn.) were taken and subjected to continuous hot percolation with different solvents of increasing order of polarity such as pet ether, chloroform, acetone, ethanol, and aqueous successively for 72 h. The solvents used were purified before use.

Method of Extraction
Continuous hot percolation process.

Requirements
Shade dried coarse powder of bark of *Commiphora caudata* and *Commiphora wightii* (Arn.) Soxhlet apparatus.

Solvents Used
Petroleum ether (60-80°C), Chloroform, Acetone, Ethanol 95% v/v (75-78°C), Distilled water

Petroleum ether bark extracts of *Commiphora caudata* and *Commiphora wightii* (Arn.)
The shade-dried coarsely powdered bark of *Commiphora caudata* and *Commiphora wightii* (Arn.) (500mg) were extracted with petroleum ether (60-80°C) for 72 h. After completion of extraction, the defatted extracts were filtered while hot through Whatman filter paper (No. 10) to remove any impurities if present. The extract was concentrated by vacuum distillation to reduce the volume to 1/10; the concentrated extract was transferred to a 100ml beaker, and the remaining solvent was evaporated in a water bath. The dark greenish yellow-coloured extract was obtained. The concentrated extract was then kept in a desiccator to remove the excessive moisture. The dried extract was packed in an airtight glass container for further study.

Chloroform bark extracts of *Commiphora caudata* and *Commiphora wightii* (Arn.)
The marc left after pet ether extraction was dried and then extracted with chloroform (59.1-61.5°C) for 72 h. After completion of extraction, the solvent was removed by distillation. The dark greenish-brown coloured extract was obtained. The extract was then stored in a desiccator to remove the excessive moisture. The dried extract was packed in an airtight glass container for further study.

Acetone bark extracts of *Commiphora caudata* and *Commiphora wightii* (Arn.)
The marc left after chloroform extraction was dried and then extracted with acetone (55.5-56.5°C) for 72 hrs. After completion of extraction, the solvent was removed by distillation. The dark brown-coloured extract was obtained. The extract was then stored in a desiccator to remove the excessive moisture. The dried extract was packed in an airtight glass container for further study.

Ethanolic bark extracts of *Commiphora caudata* and *Commiphora wightii* (Arn.)
The marc left after acetone extraction was dried and then extracted with ethanol (75- 18°C), for 72 hrs. After completion of extraction, the solvent was removed by distillation. The dark brown-coloured extract was obtained. The extract was then stored in a desiccator to remove the excessive moisture. The dried extract was packed in an airtight glass container for further studies.

Aqueous bark extracts of *Commiphora caudata* and *Commiphora wightii* (Arn.)
The marc left after ethanol extraction was again dried and then macerated with distilled water in 2liters round bottom flask for 72 hrs. and 10 ml of chloroform was added to avoid fungal growth. After completion of extraction, it was filtered, and the solvent was removed by evaporation to dryness on a water bath. Brown-coloured extract was obtained and stored in a desiccator to remove the excessive moisture. The dried extract was packed in an airtight glass container for further study.
The colour, consistency and percentage yield of the above extracts were expressed in Table.1

Identification of Phytochemical Active Constituents [37, 38]
The extracts obtained (Petroleum ether, Chloroform, Acetone, Ethanol, and Aqueous) were subjected to the following preliminary phytochemical studies.

Test for alkaloids
Dragendorff's test: To 2 mg of the extracts, 5 ml of distilled water was added; 2 M Hydrochloric acid was added until an acid reaction occurred. To this, 1 ml of Dragendorff's reagent was added. The formation of an orange or orange-red precipitate indicates the presence of alkaloids.

Hager's test: To 2 mg of the extracts were taken in a test tube, and a few drops of Hager's reagent were added. The formation of yellow precipitate confirms the presence of alkaloids.

Wagner's test: 2 mg of extract were acidified with 1.5% v/v of hydrochloric acid, and a few drops of Wagner's reagent were added. A yellow or brown precipitate indicates the presence of alkaloids.
To a few drops of Mayer's reagent, 2 mg of extracts were added. The formation of a white or pale-yellow precipitate indicates the presence of alkaloids.

Test for carbohydrates
Anthrone test: 2mg of extracts were shaken with 10ml of water, filtered, and the filtrate was concentrated. To this 2ml of anthrone, a reagent solution was added. The formation of green or blue colour indicates the presence of carbohydrates.

Benedict's test: 2mg of extracts were shaken with 10ml of water, filtered, and the filtrate was concentrated. To this, 5ml of Benedict's solution was added and boiled for 5 minutes. The formation of a brick-red coloured precipitate indicates the presence of carbohydrates.

Fehling's test: 2mg of extracts were shaken with 10ml of water, filtered and then the filtrate was concentrated. To this, 1ml mixture of equal parts of Fehling's solution A and B were added and boiled for a few minutes. The formation of a red or brick red-coloured precipitate indicates the presence of reducing sugar.

Molisch's test: 2mg of extracts were shaken with 10ml of water, filtered, and the filtrate was concentrated. These 2 drops of freshly prepared 20% alcoholic solution of a-naphthol were added. 2ml of conc. sulphuric acid was added to form a layer below the mixture. A Red-Violet ring appears, indicating the presence of carbohydrates which disappear with the addition of an excess of alkali.

Test for flavonoids

Shinoda's test: 2 mg of extracts were dissolved in 5ml of ethanol, and these 10 drops of dilute hydrochloric acid followed by a small piece of magnesium were added. The formation of pink, reddish or brown color indicates the presence of flavonoids.

With conc. sulphuric acid test: Yellow-orange colour (anthocyanins), yellow to orange colour (flavones), and orange to crimson (flavanones).

Test for glycosides

Molisch's test: 2mg of extracts were shaken with 10ml of water, filtered, and concentrated filtrate. To these 2-3 drops of Molisch's reagent were mixed, and 2ml of concentrated sulfuric acid was added carefully through the side of the test tube. The reddish violet ring appears, indicating the presence of glycosides.

Test for proteins and free amino acids

Small quantities of the extracts were dissolved in a few ml of water and treated with the following reagents.

Million's reagent: The appearance of red colour shows the presence of protein and free amino acid.

Ninhydrin reagent: The appearance of colour purple shows the presence of proteins and free amino acids.

Biuret test: The equal volumes of 5% sodium hydroxide solution and 1% copper sulphate solution was added. The pink or purple colour shows the presence of proteins and free amino acids.

Test for saponins

Foam test: In a test tube containing about 5 ml of extracts, a drop of sodium bicarbonate solution was added. The test tube was shaken vigorously and left for 3 minutes. The formation of honeycomb-like froth indicates the presence of saponins.

Test for sterols

Liebermann - Burchard's test: 2 mg of dry extracts were dissolved in acetic anhydride, heated to boiling, cooled, and then 1 ml of concentrated sulphuric acid was added along the sides of the test tube. The formation of green colour indicates the presence of steroids.

Salkowski Reaction: 2 mg of dry extracts were shaken with chloroform, to then chloroform layer sulphuric acid was added slowly by the sides of the test tube. The formation of red colour indicated the presence of steroids.

Tests for fixed oils

Spot test: Small quantities of various extracts were separately pressed between two filter papers. The appearance of an oil stain on the paper indicates the presence of fixed oil. A few drops of 0.5N alcoholic potassium hydroxide were added to a small quantity of various extracts along with a drop of phenolphthalein. The mixture was heated in a water bath for 1-2 h. The formation of soap with partial neutralization of alkali indicates the presence of fixed oils and fats.

Test for triterpenes

One mL of chloroform was used to dissolve ten milligrammes of the extract, followed by one mL of acetic anhydride and two millilitres of concentrated H_2So_4. The formation of reddish violet colour indicates the presence of triterpenes.

Test for phenolic compounds and tannins

Small quantities of the extracts were taken separately in water, and a test for the presence of phenolic compounds and tannins was carried out with the following reagents.

- Dilute Ferric chloride solution (5%) - Violet color.
- 1% solution of gelatin containing 10% sodium chloride- White precipitate.
- 10% lead acetate solution - White precipitate.

From the above-stated extracts, the results showed that the ethanol and aqueous extract have the presence of the same type of constituents. Hence, the ethanolic extract with the polarity in between was selected for further pharmacological evaluation.

Determination of extractive values

Various physicochemical parameters such as water-soluble extractive value, alcohol soluble extractive value, total ash, acid insoluble ash, water soluble ash were determined as per Indian Pharmacopoeia.

Determination of water-soluble extractive value

5 gm of coarsely powdered, air-dried drug was macerated with 100 ml of Chloroform water of the single strength in a closed flask for 24 hours, shaking frequently during the first 6 hours and allowed to stand for 18 hours. Thereafter, filtered rapidly taking precautions against loss of water, 25 ml of the filtrate was evaporated to dryness in a tared flat-bottomed shallow dish, dried at 105 ^{0}C and weighed. The percentage of water-soluble extractive with reference to the air-dried drug was calculated.

Determination of alcohol-soluble extractive value

5 gm of coarsely powdered, air-dried drug was macerated with 100 ml of ethanol of the specified strength in a closed flask for 24 hours, shaking frequently during the first 6 hours and allowed to stand for 18 hours. Thereafter, filtered rapidly taking precautions against loss of ethanol, 25 ml of the filtrate was evaporated to dryness in a tared flat-bottomed shallow dish, dried at 105 ^{0}C and weighed. The percentage of ethanol-soluble extractive with reference to the air-dried drug was calculated.

The volatile ether soluble extractive value, chloroform soluble extractive value, ether soluble extractive values are the other parameters for extractive values.

Determination of ash value

2 gm of the air - dried crude drug was weighed accurately in a tared silica dish and incinerated at a temperature not exceeding 450^{0}C until free from carbon, cool and weigh. The percentage of ash with reference to the air - dried drug was calculated.

Determination of water - soluble ash

Boiled the ash, for 5 minutes with 25 ml of water; collected the insoluble matter in a Gouch crucible, wash with hot water and ignited for 15 minutes at a temperature not

exceeding 450^{0}C. Subtract the weight of the insoluble matter from the weight of the ash; the difference in weight represents the water-soluble ash. The percentage of water-soluble ash with reference to the air -dried drug was calculated.

Determination of acid soluble and acid - insoluble ash
Boiled the ash with 25 ml of 2M hydrochloric acid for 5 minutes, collected the insoluble matter on an ashless filter paper, washed with hot water, ignited, cooled in a desiccator and weighed. The percentage of acid soluble and acid - insoluble ash with reference to the air - dried drug was calculated.

Determination of Loss on drying
Weight a glass-stopper, shallow weight bottle that dried under the same conditions to be employed in the determination. Transfer 2 gm of sample to the bottle. Cover it and accurately weight the bottle. Distribute the sample as evenly as practicable by gentle sidewise shacked to a depth not exceeding 10 mm. Place the loaded bottle in the oven. Removed the stopper and leaved it also in the chamber. Dried the sample to constant weight or for the specified time. After dry completed, opened the drying chamber, closed the bottle promptly and allowed it to cool to room temperature in a desiccator before weight. Weight the bottle and the contents. Calculated Loss on Drying in terms of percent w/w.

Pharmacognostic investigation
In Pharmacognostic study of bark of *Commiphora caudata and Commiphora wightii* macroscopy, microscopy, powder characteristic and physicochemical parameters were studied.

Macroscopy

Table 1: Morphological and Organoleptic Characters for bark of *Commiphora caudata and Commiphora wightii*

Sr. No.	Parameters	***Commiphora caudata***	***Commiphora wightii***
1	Color	Greysh, new bark-bright green	Reddish brown
2	Odor	characteristic	Odourless
3	Taste	characteristic woody	Bitter pungent
4	Texture	Smooth, papery, branchelets glabrous	Smooth
5	Shape	Irregular corrugate	Solid

Table 2: Powder characteristics chemical tests for bark of *Commiphora caudata and Commiphora wightii*

Sr. No.	Part of Plant	Reagents	Observation	Characteristics
1	*C. wightii*	Alcholic picric acid	Yellow	Small acicular raphides calcium oxalate crystals
	C. caudata		Yellow	Small acicular raphides calcium oxalate crystals
2	*C. wightii*	Pholorog. + Con. HCl (1:1)	Pink	Lignified reticulate parenchyms of mesocarp & vascular bundles.
	C. caudata		Pink	Lignified reticulate parenchyms of mesocarp & vascular bundles.

Table 3: Physical description / organoleptic properties of plants of *Commiphora caudata and Commiphora wightii*

Sr. No.	Name of the Plant	Colour	Odour	Nature
1	*Commiphora wightii (Arn)*	Reddish brown	Odourless	Bark
2	*Commiphora caudata*	Grey brown or yellow	Odourless	Bark

Table 4: Preliminary Phytochemical Test of Various Bark Extracts of *Commiphora caudata and Commiphora wightii*

Sr. No.	Name of the Extract	**Phytochemical Active Constituents of *Commiphora caudata***	**Phytochemical Active Constituents of** Commiphora ***wightii***
1	Petroleum ether extract	Alkaloids, Steroids, Phenolic compound, Tannin, Glycosides, Terpenoids, Triterpenes.	Alkaloids, Glycosides, Phytsterols, Oils and fats
2	Chloroform extract	Alkaloids, Steroids, carbohydrates, Phenolic compounds, Tannin, Glycosides, Terpenoids, saponins, and Triterpenes.	Alkaloids, Carbohydrates, flavonoids, phenolic compounds
3	Acetone extract	Alkaloids, Steroids, carbohydrates, Phenolic compounds, Tannin, Glycosides, Terpenoids, and Triterpenes.	Carbohydrates, Alkaloids, Glycosides, Flavonoids
4	Ethanol extract	Alkaloids, Steroids, carbohydrates, Tannin, Terpenoids, Triterpenes, and Proteins.	Carbohydrates, Proteins & amino acids, Alkaloids, Saponins, Phytosterols, Flavonoids
5	Aqueous extract	Alkaloids, Steroids, carbohydrates, Phenolic compounds, Tannin, Glycosides, Terpenoids, and Triterpenes.	Carbohydrates, Proteins & amino acids, Alkaloids, Saponins, Phytosterols, Flavonoids

Powder microscopy
In the powder, crystals were also seen in the bark; as well prismatic crystals, sclerenchyma bands, sclerids, scattered calcium oxalate were observed.

Ash values
Standardization of plant was done with the help of total ash values, water soluble ash values, acid insoluble ash values and loss on drying. They were found to be

Table 5: Ash values for bark of *Commiphora caudata and Commiphora wightii*

Sr. No.	Evaluation parameter	**Yield of *Commiphora caudata* (% w / w)**	**Yield of *Commiphora wightii* (% w / w)**
1	Total ash	08	03
2	Water soluble ash	22	13
3	Water insoluble ash	17	08
4	Acid soluble ash	0.32	0.25

5	Acid insoluble ash	0.67	0.56
6	Loss on drying	2.2	3.5
7	Alcohol soluble extractives	26	26
8	Ether soluble extractives	23.78	19.35
9	Water soluble extractives	28.40	23.75

Standardization of plant was done with the help of extractive values, total ash values, water soluble ash values and acid insoluble ash values. Water soluble extractive value was found to be greater than alcohol soluble extractive value in the experiment. There are more polar compounds present in pulp and seed part.

Table 6: Evaluation of active Phytochemical constituents of *Commiphora caudata and Commiphora wightii*

Sr. No	Solvent	Phytochemical Constituents of *Commiphora caudata*	Phytochemical Constituents of *Commiphora wightii*
1	Petroleum ether extract	Alkaloids, Steroids, Phenolic compound, Tannin, Glycosides, Terpenoids, Triterpenes.	Alkaloids, Glycosides, Phytsterols, Oils and fats
2	Chloroform extract	Alkaloids, Steroids, carbohydrates, Phenolic compounds, Tannin, Glycosides, Terpenoids, saponins, and Triterpenes.	Alkaloids, Carbohydrates, flavonoids, phenolic compounds
3	Acetone extract	Alkaloids, Steroids, carbohydrates, Phenolic compounds, Tannin, Glycosides, Terpenoids, and Triterpenes.	Carbohydrates, Alkaloids, Glycosides, Flavonoids
4	Ethanolic extract	Alkaloids, Steroids, carbohydrates, Tannin, Terpenoids, Triterpenes, and Proteins.	Carbohydrates, Proteins & amino acids, Alkaloids, Saponins, Phytosterols, Flavonoids
5	Aqueous extract	Alkaloids, Steroids, carbohydrates, Phenolic compounds, Tannin, Glycosides, Terpenoids, and Triterpenes.	Carbohydrates, Proteins & amino acids, Alkaloids, Saponins, Phytosterols, Flavonoids

Table 7: Determination of Moisture Content or LOD for bark of *Commiphora caudata and Commiphora wightii*

Time (Min)	0	10	30	60	90	120	150	180	210	240	270
Commiphora caudata	0.0	2.1	2.8	3.2	3.2	4.2	4.5	4.8	5.4	5.6	5.7
Commiphora wightii	0.0	1.8	2.1	2.9	3.1	3.8	4.2	4.5	4.9	5.2	5.4

The percentage of loss on drying was found to be 5.7%w/w and 5.4%w/w respectively

Table 8: Extractive values for bark of *Commiphora caudata and Commiphora wightii*

Sr. No.	Extracts	Yield of *Commiphora caudata* (%w/w)	Yield of *Commiphora wightii* (%w/w)
1	Pet. Ether	4.5%	3.8%
2	Chloroform	7.5%	2.6%
3	Acetone	5.7%	3.2%
4	Ethanol	13.5%	11.2%
5	Aqueous	10.8%	9.6%

Table 9: Preliminary screening of extracts for bark of *Commiphora caudata and Commiphora wightii*

Sr. No.	Consti-tuents	Tests	PCC	PCW	CCC	CCW	ACC	ACW	ECC	ECW	ACC	ACW
1	Alkaloids	Dragendorff's test	+	+	+	+	+	+	+	+	+	+
		Hager's test	+	+	+	+	+	+	+	+	+	+
		Wagner's test	+	+	+	+	+	+	+	+	+	+
		Mayer's test	+	+	+	+	+	+	+	+	+	+
2	Flavonoids	Shinoda's test	-	-	-	-	-	-	-	+	-	+
		With conc. sulphuric acid test	+	-	+	-	+	-	-	+	-	+
3	Carbohy-drate	Anthrone test	+	-	+	-	+	-	-	+	+	+
		Benedict's test	-	-	+	-	-	-	+	+	_	+
		Molisch's test	+	-	+	-	-	-	-	+	+	+
		Fehling's test	-	-	+	-	+	-	+	+	-	+
4	Glycosides	Molisch's test	+	+	+	+	+	+	-	+	+	+
5	Proteins and free amino acids	Million's reagent	+	-	-	-	+	-	+	+	-	+
		Ninhydrin reagent	-	-	-	-	-	-	+	+	-	+
		Biuret test	+	-	-	-	+	-	-	+	+	+
6	Sterols	Liebermann - Burchard's test	+	+	+	+	+	-	+	+	+	+
		Salkowski Reaction	+	+	-	+	+	-	+	+	-	+
7	Saponins	Foam test	-	-	+	-	-	-	-	+	-	+
8	Triterpenes	Test with cons H_2So_4	+	+	+	+	+	+	+	+	+	+
9	Phenolic compounds	Test with NaOH	+	-	+	-	+	-	+	-	+	-
		Test with lead acetate solution	+	-	+	-	-	-	-	-	+	-
10	Tannin	Test with ferric chloride	+	+	+	+	+	+	+	+	+	+

Abbreviations: PCC- Petroleum ether *Commiphora caudata*, PCW- Petroleum ether *Commiphora wightii*, CCC- Chloroform *Commiphora caudata*, CCW- Chloroform *Commiphora wightii*, ACC- Acetone *Commiphora caudata* ACW- Acetone *Commiphora wightii*, ECC- Ethanol *Commiphora caudata*, ECW- Ethanol *Commiphora wightii*, ACC- Aqueous *Commiphora caudata*, ACW- Aqueous *Commiphora wightii*

Table 10: Colour, consistency, and percentage yield of *Commiphora caudata* and *Commiphora wightii*

Sr. No.	Part Used	Plant Name	Solvent	Color	Consistency	% Yield of Extract
1	Bark	*Commiphora caudata*	Pet. Ether	Dark Green	Stiff paste	4.5%
		Commiphora wightii		Green	Stiff paste	3.8%
2		*Commiphora caudata*	Chloroform	Dark Green	Stiff paste	7.5%
		Commiphora wightii		Dark Green	Stiff paste	2.6%
3		*Commiphora caudata*	Acetone	Green	Sticky	5.7%
		Commiphora wightii		Green	Sticky	3.2%
4		*Commiphora caudata*	Ethanol	Dark Green	Stiff paste	13.5%
		Commiphora wightii		Dark Green	Stiff paste	11.2%
5		*Commiphora caudata*	Aqueous	Reddish Brownish	Sticky semi solid	10.8%
		Commiphora wightii		Brownish	Sticky semi solid	9.6%

Results and discussion

The phytoconstituents were extracted using solvents of increasing polarity like petroleum ether, chloroform, acetone, ethanol and aqueous extract by continuous hot percolation method.

In the present study by using the pharmacognostic and phytochemical evaluation confirmed the various determination parameters of *Commiphora caudata* and *Commiphora wightii* crude drug, macroscopic characters, powder characteristics, ash values, evaluation of active phytochemical constituents, loss on drying, extractive values, preliminary screening, colour, consistency, and percentage yield. Macroscopic characters like color, odor, taste, shape characteristics were noted. *Commiphora caudata* and *Commiphora wightii* crude drugs barks powder microscopy showed in common useful diagnostic features like prismatic crystals, sclerenchyma bands, sclerids, scattered calcium oxalate were observed. Commiphora caudate bark values are as Total ash 08, Water soluble ash 22, Water insoluble ash 17, Acid soluble ash 0.32, Acid insoluble ash 0.67, Loss on drying 2.2 and 1.2, Alcohol soluble extractives 26, Ether soluble extractives 23.78, Water soluble extractives 28.40 while *Commiphora wightii* bark values are as Total ash 03, Water soluble ash 13, Water insoluble ash 08, Acid soluble ash 0.25, Acid insoluble ash 0.56, Loss on drying 3.5, Alcohol soluble extractives 26, Ether soluble extractives 19.35, Water soluble extractives 23.75. The percentage of loss on drying for Commiphora caudate bark values was found to be 5.7%w/w. The percentage of loss on drying for *Commiphora wightii* bark values was found to be 5.4%w/w. Extractive values for Commiphora caudate bark values Petroleum ether extract 4.5%w/w, Chloroform extract 7.5%w/w, Ethanol extract 13.5%w/w, Aqueous extract 10.8%w/w. Extractive values for *Commiphora wightii* bark values Petroleum ether extract 3.8%w/w, Chloroform extract 2.6%w/w, Ethanol extract 11.2%w/w, Aqueous extract 9.6%w/w. Preliminary screening for Color, Consistency and percentage yield of Commiphora caudate bark values are as Petroleum ether is dark green and stiff paste consistency with 4.5% yield of extract; Chloroform is dark green and stiff paste consistency with 7.5% yield of extract; Acetone is green and sticky consistency with 5.7% yield of extract; Ethanol is dark green and stiff paste consistency with 13.5% yield of extract; Aqueous is reddish brown and sticky semi solid paste consistency with 10.8% yield of extract. Preliminary screening for Color, Consistency and percentage yield of *Commiphora wightii* bark values are as Petroleum ether is green and stiff paste consistency with 3.8% yield of extract; Chloroform is dark green and stiff paste consistency with 2.4% yield of extract; Acetone is green and sticky consistency with 3.2% yield of extract; Ethanol is dark green and stiff paste consistency with 11.2% yield of extract; Aqueous is brownish and sticky semi solid paste consistency with 9.6% yield of extract.

Conclusion

It is concluded that *Commiphora caudata* and *Commiphora wightii* is the plants with a various medicinal uses. The pharmacognostic and phytochemical evaluation confirmed the various determination parameters of *Commiphora caudata* and *Commiphora wightii* crude drug, macroscopic characters, powder characteristics, ash values, moisture content, extractive values and preliminary screening of extracts. The present study confirmed the precise values for *Commiphora caudata* and *Commiphora wightii* pulp crude drug which can be further explored to the comparative biological activity for further confirmation. This help for isolation of constituents from each extracts. These valuable information data may provide a base to start the search related to phytochemistry, pharmacology, pharmacognosy and general investigations to researchers, as well as practitioners related to this plant. Therefore, attention should also be made on proper exploitation and utilization of this medicinal plant.

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Conflicts of interest

We declare that we have no conflict of interest.

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