

Macroscopic, phytochemical and fluorescent analysis of *Colebrookea oppositifolia* smith

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Abstract

Colebrookea oppositifolia Smith is a relatively uncommon shrubby member of Lamiaceae. The plant stands out with his woody habit and unique inflorescence. In present study, macromorphological evaluation areal part of this plant was done. The plant was found to be rich in phytochemical composition. Its powder showed various coloration with different laboratory reagents under normal and UV light. This detailing of plant part could be an important aspect for its correct identification and identification its powder in local market.

Keyword: *Colebrookea oppositifolia* Smith, Macromorphology, Phytochemistry

1. Introduction

In nature, plants are widely used as raw ingredients for many traditional preparations in most medicine system. To confirm the genuineness of the raw drug material and to detect the presence of adulterant traces, comprehensive and detailed pharmacognostic evaluation of raw drug is necessary. Usually these raw drugs were collected by the traditional herbal healers commonly known as Vaidoo's or Mukhiya; practicing plant based complementary system of medicine. Their identification is commonly based on macroscopic structural features or other unique visible characteristics. Therefore, in such manual practices there is a chance of accidental collection of improper or wrong plant material. Hence, supportive microscopic, physicochemical and phytochemical screening was required that is helpful to avoid any ambiguity [1, 2].

Colebrookea oppositifolia is a monotypic genus of Lamiaceae, first described in 1806. It is commonly called as Bhaman in local. The plant possesses antimicrobial, antifungal and antioxidant attributes due to high content of flavonoids and polyphenols. It is used for treating sore eyes, corneal opacity or conjunctivitis due to its anti-inflammatory effects [3]. The plant material is generally used to cure the diseases like epilepsy, fever, headache, and urinary problems. It possesses hepatoprotective, cardioprotective and anti-inflammatory attributes. *Colebrookea* has anthelmintic properties which is used in the management of ringworms and it is also employed in the treatment of dermatitis, nose bleeds, bleeding, bloody coughs and dysentery [4].

Despite, a lot of therapeutic uses, there is not any comprehensive pharmacognostical information available on structural morphology and other physicochemical standards, generally needed for the quality control for the plant. Therefore, the present study was undertaken to identify the macroscopic characters, major phytochemicals and crude powder fluorescent analysis.

2. Materials and Methods

The plant material was collected from Chikhaldara range forest, Amravati Division (MS). The collected plant material was identified taxonomically [5] and one specimen copy of the plant was deposited in herbarium of Department of Botany, Shri Shivaji College, Akola (MS).

2.1 Macroscopic evaluation

All macroscopic evaluations of leaf and stem were carried out on 5 samples of each part. The taxonomical description was made according to the related articles and the data given in different books [6].

2.2 Fluorescence analysis

U.V. fluorescence analysis of powdered leaf and stem was carried out by treating them with different reagents and was observed in ordinary light and U.V. light [7].

2.3 Phytochemical analysis:

The phytochemical analysis was carried out according to the standard procedures [8, 9, 10].

3. Results and Discussion

In its habitat, *Colebrookea oppositifolia* is a plant with an average height of about 1-3 m. It has pale hairy stout square branches. Petiole - (0.8-2.5 cm), leaf blade - (10-15 × 3-5 cm), base - broadly cuneate to rounded, margin - crenulate-serrulate, apex -long acuminate, adaxially rugulose and puberulent, abaxially densely tomentose to lanate-tomentose. Numerous tiny white flowers occur in panicles of upright spikes - (10-15 cm long) branches - (4-7 cm); verticillasters - 10-18 flowered, globose; bracteoles - (1 mm), densely tomentose outside, glabrous inside. Flowers - (2 mm), pistillate: calyx campanulate - (1.5 mm-6 mm) in fruit, tube very short, visibly ribbed; teeth subulate, later spinescent, ± purple. Corolla tube puberulent, lower lip slightly longer than upper lip, with middle lobe ovate. Stamens inserted on apical part of tube, included. Style 2 × as long as corolla. In bisexual flowers: calyx minute - (0.6 mm), corolla (3 mm); upper lip ovate-oblong - (0.5 mm), straight, emarginate; lower lip elongated, spreading - (1.5 mm), middle lobe ovate-oblong, 2 × as long as ovate lateral lobes. Style erect, slightly longer than corolla. Nutlets are obovoid - (1 mm), yellow-brown in color, with a small basal white scar (Table-1). Flowering period ranges from January-March, through March-April [11, 3].

The fluorescence analysis revealed various colors of the extracts under ordinary normal light and U.V. light (Table 2). The phytochemical screening of plant material mainly revealed the presence of terpenoids, sterols, glycosides, flavonoids, alkaloids, carbohydrates, tannins, phenols and lignins (Table 3).

Traditional natural plant based remedies favorable choices over synthetically formulated drugs. It is of importance to individualize the consumption of herbal products not merely based on the knowledge of folklore use but through systematic studies^[1]. Pharmacognostic, physicochemical and phytochemical evaluations are of robust entitlement of entire crude drug profile in context of its pharmaceutical and pharmacological importance^[9]. The fluorescence analysis was a valuable and modest method for the identification of fluorescent compounds. Different compounds give fluorescence when exposed to U.V. (Table 2). Powder from different plants also behaves differently under UV light^[12].

Table 1: Macroscopic characters of Leaf and stem of *C. oppositifolia*

Plant part	Features	Observations
Leaf	Leaf blade	Lanceolate (10-15 x 3-5 cm)
	Base	Cuneate or rounded
	Margin	Crenulate or serrulate
	Apex	Long, acuminate
	Color	Dirty/ Dark green
Stem	Texture	Hairy
	Height	1-3 meter
	Color	Dusty brown
	Texture	Glabrous
	Fracture	Woody

Table 2: Fluorescence analysis of Leaf and stem powder of *C. oppositifolia*

S. N.	Reagent	Leaf powder		Stem powder	
		Normal light	UV- light	Normal light	UV- light
1	Powder	Dirty Green	Light Green	Light Green	Light Green
2	Powder + Water	Dirty green	Light brown	Light brown	Light green
3	Powder+ 5% NaOH	Yellow green	Brown	Amber yellow	Green
4	Powder+ 5% FeCl ₃	Dark brown	Blackish brown	Dark Brown	Black
5	Powder+ 50% H ₂ SO ₄	Light green	Greenish brown	Light brown	Light green
6	Powder+ 50% HCl	Translucent green	Greenish brown	Dirty yellow	Greenish brown
7	Powder+ Pet. Ether	Amber yellow	Yellow	Hazy brown	Yellow
8	Powder+ MeOH	Emerald green	Brown	Hazy brown	Light yellow
9	Powder+ Picric acid	Amber yellow	Yellow	Sharp yellow	Blackish

Table 3: Phytochemical analysis of Leaf and stem powder of *C. oppositifolia*.

Sr. No.	Phytochemicals	Test	Leaf powder	Stem powder
1	Alkaloids	Dragendraft's test	+	+
2	Flavonoids	NaOH test	+	+
3	Phenolics	FeCl ₃ test	+	-
4	Glycosides	Keler- Killiani test	+	-
5	Sterols	Salkowaski test	+	+
6	Terpenoids	Liebermann's test	+	+
7	Tannins	Braymer's test	-	+
8	Saponin	Foam test	-	-

4. Conclusion

The current investigation reveals the pharmacognostic features and physicochemical properties of *Colebrookea oppositifolia*. The present findings are associated with standardization of parameters like macroscopic characters, phytochemical screening and fluorescent analysis of *C. oppositifolia*. Such study on the macroscopic characters, preliminary phytoconstituent screening and fluorescence analysis of powdered drug material are important information which may be useful in verification and to identify contamination for quality control of this therapeutic plant afterwards.

5. References

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