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Pharmacognostic and Qualitative Evaluation of the Root of the Plant *Jasminum multiflorum* Andr.

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ABSTRACT

Natural products sometimes have therapeutic benefit as traditional medicines for treating diseases. Traditional medicine being non-toxic, have minimal side effects and easily available at affordable price, so much of the world's population rely on it to meet daily health requirements especially within developing countries. The root of Jasminum multiflorum (Andr.) was evaluated for different studies such as microscopic, macroscopic evaluation. The root was also evaluated for different ash values and extractive values. Qualitative evaluation of same part of the plant was also carried out using different solvents according to polarity of the solvents. It was observed that the water soluble ash value remains greater than sulphated ash and it was found that in case of extractive value water soluble extractive value was greater than ethanol soluble extractive value. The qualitative evaluation indicates the presence of cardiac glycoside, steroid, flavonoids and saponins. The plant was used to serve for traditional purposes like indolent ulcer, pitta, inflammation, rheumatism and cobra venom etc., by different trivals but the root is much more potent as per folklore claim. So, current pharmacognostic and other preliminary studies were done to attract the researcher to ascertain pharmacological and phytochemical investigation.

Keywords: *Jasminum multiflorum* (Andr.), Microscopic, Qualitative, Cardiac glycoside, Flavonoids, Steroid, Indolent ulcer, Pitta, Inflammation

INTRODUCTION

From ancient age, India and China were recognized as a rich source of medicinal plant. Due to non-toxicity and minimization of side effect the herbal medicine are used widely. According to World Health Organisation (WHO) 80% of the population of the subtropical countries use plant for their initial treatment towards many disease [1,2]. Worldwide trend towards the utilization of natural plant remedies has created an enormous need for information about the properties and uses of the medicinal plants. Medicinal plants play a major role in the health care sector of developing nations for the management of diseases. Thus herbal medicines have a prominent role to play in the pharmaceutical markets and health care sector of the 21st century [3,4].

Jasminum multiflorum (Kunda in Sanskrit, kundaphul in Bengali, chameli in Hindi; Family: Oleaceae) is a large scandent, tomentose shrub with young brances clothed with velvety pubescence, distributed and cultivated nearly tropical and sub-tropical areas throughout India. The plant is considered as cool, sweet and dried leaves of the plant are used for indolent ulcer [5]. The flowers are useful in vitiated condition of pitta, inflammation, rheumatism and cephalalgia. The root is antidote to cobra venom [6,7]. Only the flowers of the different species of *Jasminum* are used in the perfume industry. And the plant is mostly recognized such purpose [7]. After collecting different folklore claim and literature survey, it was observed that the aerial parts were exposed to produce some CNS- related study and little chemical characterization. The root portion of the plant did not show any reported works till date though the root is used as more potent among different parts of the plant as per folklore claim.

Studies on different species of jasmine

Jasmine is an essential oil bearing plant belongs to the family Oleaceae. The fragrant world of the *jasmine* comprises different varieties of bela, chameli and juhi. The distribution of the genus is wide but majority of the species were centered around India, China and Malaya (Table 1). The critical analysis of the species position revealed the true species [8].

Table 1: The distribution of the genus is wide but majority of the species were centered around India, China and Malaya

S. No	Name of the jasmine species	Common name	Natural distribution
1.	*Jasminum grandiflorum (L)*	Chameli	Nilgiri, north west Himalaya. Altitude 700-1800 m
2.	*Jasminum officinale Linn.*	Sweet jasmine	Throughout India and moist forest.
3.	*Jasminum multiflorum Roth.*	Safed chameli	Western coast, Mysore, Malabar. Altitude 1300 m
4.	*Jasminum humile Linn.*	Pili chameli	North western Himalaya, Niligiri altitude
5.	*Jasminum heterophyllum Roxb.*		Mishmi hills
6.	*Jasminum glandulosum wall.*	*J. dichotomum*	Himalaya, Kumaon, Lushai Hills. Altitude 700-2000 m
7.	*Jasminum angustofolium Vahl.*	Wild jasmine	Deccan peninsula, south Travancore
8.	*Jasminum arborescence Roxb.*	Tree jasmine	Tropical north west Himalaya, chota Nagpur
9.	*Jasminum androphyllum Roxb.*		Kashia hills
10.	*Jasminum auriculantum Vahl*	Joohi, jui	North west India, Deccan peninsula, south Travancore, western ghat
11.	*Jasminum anastomosans Wall.*	*J. strinerve Roxb.*	Kashia Hills, Cuttok
12.	*Jasminum azoricum Backer*		South west India
13.	*Jasminum braviloburn Roxb.*	*J. nilgricum Pl.*	Ghats, Nilgiri hills. Alt 1000-2000 m
14.	*Jasminum brevipetiolum Duthe*		Rehil khand, Kheri dist. Of upper gangetic plains
15.	*Jasminum calophyllum Wall*	*J. courtollense Wt.*	Decan peninsula, Nilgiri hills, western ghats. upto 1300 m
16.	*Jasminum caudatum Walt.*	*J. ovatum Walt*	Khasia, Mishmi hills. Alt upto 1300 m
17.	*Jasminum coaretatum Roxb.*	*J. reticulatum Walt.*	Assam, khassia, lushi hills. Alt 1000 m
18.	*Jasminum cardifolium Walt.*	*J. eretiflorum wt.*	Western ghats, nilgiri, south Andaman.
19.	*Jasminum dispermum Wall.*		Temperate Himalaya, Kashmir, Khasia. Alt 1500 m
20.	*Jasminum flexile Vahl.*		Deccan peninsula, ghats of north kanara, west coast. Alt 1700 m
21.	*Jasminum malabaricum Wt.*	Mogra	Western coast, western ghats of Kanara, Malabar, West nilgiris. Alt 1300 m

Botanical and scientific classification (Table 2) [9,10,11]

Table 2: Botanical and scientific classification

Kingdom	Plantae
Subkingdom	Tracheobionta
Division	Magnoliophyta
Family	*Oleaceae*
Tribe	Jasmineae
Group	Dicot
Class	Magnoliopsida
Subclass	Asteranae
Order	Lamiales
Genus	*Jasminum*
Species	*multiflorum*
Botanical name	*Jasminum multiflorum* (Burm.f.)
Andrews	

MATERIALS AND METHODS

Collection, preparation and authentication of the plant

At first the plants were collected from different locations of Purba Medinipur and north 24 parganas, West Bengal in the month of July and August 2015. The roots of the plant were cut and collected after proper washing under constant flow of tap water in the laboratory. Then the roots were subjected to air dry under shade condition for next one week. Then the roots were grinded and powdered and then the powder was passed through mesh no. 40. Then the powder sample was subjected for the different experimental work. A herbarium of this plant was prepared and subjected to authentication in the Botanical Survey of India. Then it was authenticated by Mr. R. Gogoi, scientist at Central National Herbarium, Shibpur, West Bengal with specimen no.(BT/SKP/02), Dated 09/09/2016. One voucher specimen has been also preserved in the laboratory of the Institute for further references.

Pharmacognostic study

The preliminary study of different pharmacognostic characteristics of the plant were done for the ready reference for further research work.

Macroscopic evaluation

The macroscopic evaluation of the plant reveals the study on different parameters like colour, odour, taste (Organoleptics) and other sub-characteristics of the plant by the help of normal eye.

Microscopic evaluation

Microscopic evaluation is a step towards identification of internal structure of the plant to establish proper identification. This is done by identifying internal structure such as epidermis, cortex, xylem, phloem, pith and some other specific features. For this purpose a transverse section or longitudinal section may be prepared. For this type of work transverse section was done. The roots of the sample were hard initially. So it was soften little by dipping it in a little quantity of normal water for 2-3 days [12]. The transverse section of the root was done and examined under the simple microscope in the pharmacognosy laboratory of the institute (Figure 1).

Physicochemical study

Shade-dried powder of roots were used for various phytochemical analysis as per standard method described in I.P. The determination of ash value was done to detect the presence of inorganic matter in the drug. In this context total ash value, Sulphated ash value, Water soluble ash

values were done. The dried powdered material (50 g) was defatted with petroleum ether for 24 h with occasional shaking. Then the dried powder macerated with ethanol for 24 h with occasional shaking and then to water applying the same procedure. The solvent was filtered and percentages of extractive values of the different solvents were determined. Such determination represents the quality and purity of the drug [13,14].

Qualitative evaluation of the extract

The qualitative evaluation of the root of the plant was done by the use of different solvent like petroleum ether, chloroform, ethanol and water and the result is shown in Tables 3-5.

RESULTS AND DISCUSSION

Macroscopic study

The macroscopic study of *J. multiflorum* on different parameters was done in which size, shape, colour, odour, taste were examined. It was found that leaf of *J. multiflorum* contains 1 leaflet with smooth surface. The surface of the leaf was 7-10 cm having light green colour with characteristic odour and the root showed rough surface (Table 3).

Table 3: The macroscopic study of *Jasmine multiflorum*

S. No.	Characters	Observation	
		Leaf	Root
1.	Size	Length: 7 cm, Width: 3.5 cm	Length:15 cm, Width: 08 cm
2.	Shape	Concave	Cylindrical
3.	Texture	Smooth and oily	Roughness with little fractures
4.	Fracture	Easy	Very little fractures
5.	Surface	Smooth	Rough
7.	Arrangement	Multiple manner	Not prominent
8.	Apex	Acute	NA
9.	Base	Straighted and flat	NA
10.	Petiole	Medium with some hair	NA
11.	Margin	Entire and terminal margins are visible	Not prominent

Microscopic evaluation

The transverse section of the root showed the following arrangement.

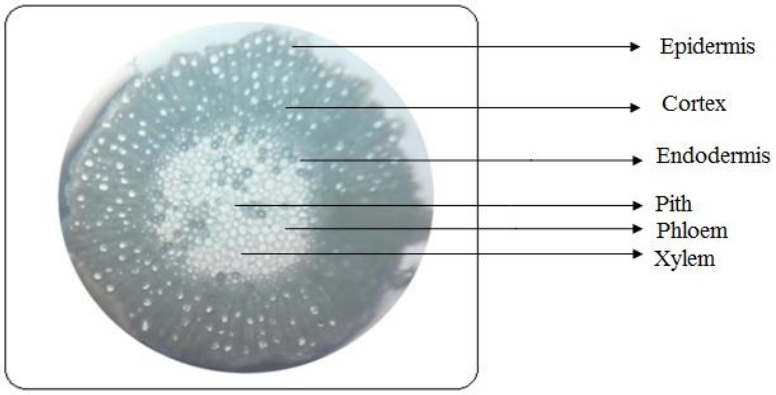

Figure 1: Transverse section of the root of the plant *Jasmine multiflorum*

Physicochemical analysis (Table 4)

Table 4: Phytochemical analysis of *Jasmine multiflorum* extract

S. No	Parameters	Results
	ash values	
1	Total ash value	2.83% w/w
2	Water soluble ash value	9.74% w/w
3	Sulphated ash value	1.08% w/w
	Extractive values	
4	Water soluble extractive value	17.6% w/w
5	Ethanol soluble extractive value	1.12% w/w

Qualitative analysis

The ethanolic and water extracts of roots of *J. multiflorum* demonstrated maximum presence of phytoconstituents. The steroid and cardiac glycoside were present in all the extracts (In petroleum, chloroform fraction lesser quantity) and little quantity of saponin was present in ethanolic fraction. Flavonoid was also present ethanolic and aqueous fractions (Table 5).

Table 5: Qualitative analysis of *Jasmine multiflorum* extract

S. No.	Test performed	Petroleum ether	Chloroform	Ethanol	Water
1	Alkaloid	-	-	-	-
2	Carbohydrate	-	-	-	-
3	Glycoside	+	+	++	++
4	Gums/Mucilage	-	-	-	-
5	Proteins/Amino acid	-	-	-	-
6	Tannins/Phenolic compound	-	-	-	-
7	Saponins	+	+	+	++
8	Steroids	+	+	++	++
9	Flavonoids	+	+	+	+

+ indicates present; ++ indicates mostly present; – indicates absent

CONCLUSION

After the preliminary phytochemical investigation it may be concluded that the roots of the plant *Jasminum multiflorum* may be evaluated for different pharmacological and phytochemical screening to ascertain the potential. The author is pleased to conclude the paper as part and parcel of his project work.

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REFERENCES

[1] P.C. Trivedi, 2nd Edition, Aavishkar publisher and distributors, Jaipur, India, **2009**, 391-392.
[2] A.N. Kalia, 2nd edition, CBS Publishers and Distributors, India, **2009**, 1-2.
[3] K. Annam, P. Houghton, *J. Ethnopharmacol*., **2008**, 141-144.
[4] R.N.Chopra, S.L. Nayar, I.C. Chopra, 3rd Edition, CSIR Publication, New Delhi, **1992**, 73-74.
[5] Anonyms, H-K Publication and Information Directorate, New Delhi, 1997, 5, 284-285.
[6] A.V. Sala, Orient Longman Pvt Limited, Chennai, **2002**, 3, 254-258.
[7] D.K. Pal, S.K. Pahari, A.K. Pathak, *Asian. J. Chem*., **2007**, 19, 2-7.
[8] V.V.Bhargava, K.A. Saluja, K.K. Dholwani, *J. Pharmacog. Phytochem*., **2013**, 1, 19-23.
[9] K.R. Kritikar, B.D. Basu, 2nd Edition, 2003, 7, 2093-2096.
[10] Anonyms; H-K Publication and information directorate, New Delhi, **1948**, 5, 289-290.
[11] D. Modak, *J. Pharmacog. Phytochem*., **2016**, 135-137.
[12] Anonyms, Part-I, **2006**, 4, 153.
[13] K.R. Khandelwal, 19th Edition Reprint, Nirali Prakashan, Pune, **2009**, 157-160.
[14] W.C. Evans, Elsevier Science, London, International Edition, WB Saunders, **2005**, 456-459.