



Original Research Article

PRELIMINARY PHYTOCHEMICAL AND PHYSICOCHEMICAL ANALYSIS OF *CURCULIGO ORCHIOIDES* GAERTN. ROOT TUBERSKB Theng^{1*} and AN Korpenwar²¹Department of Botany, Shri Shivaji Science and Arts College, Chikhli, Buldana, Maharashtra, India.²Rashtrapita Mahatma Gandhi Science and Arts College, Nagbhid, Chandrapur, Maharashtra, India.

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Abstract: The present study was included phytochemical and physicochemical analysis of crude drug *Curculigo orchioides* root tubers. Tuberos roots widely utilized as nutritive tonic for strength, as an analgesic, anti-inflammatory, in skin diseases, spermatogenic, aphrodisiac, immuno-stimulant, hepato-protective, anti-asthamatic etc. Preliminary phytochemical analysis of tuberos root was carried out in successive solvent like petroleum ether, chloroform, ethanol and acetic acid by using soxhlet extractor. The active compounds reported are carbohydrate & glycosides, alkaloids, phenolic compounds and tannin, proteins, amino acid, phytosteroids, saponins, gums and mucilage, etc. Hence present study revealed evaluation of different phytochemical and estimation of its physicochemical parameters such as extractive value, total ash, acid insoluble ash, water soluble ash and moisture content.

Key Words: *Curculigo orchioides*, kali musali, phytochemical analysis, physicochemical parameters.

INTRODUCTION

Since the immemorial time, our traditional system of medicine has been using the whole medicinal plant or a part of it for the treatment of different types of disease (Rastogi *et al.*, 2009). World Health Organization (WHO) estimated that 80% population of developing countries depends on traditional medicine mostly upon plant drugs, for their prime health care practice. Medicinal plants being worldwide accepted, non-narcotic with less side effect, protective, frequently safe, having efficient prizes and remedial utilization to achieve the goal of "Health for all" (Anonymous, 2000).

The genus *Curculigo* belongs to the family Hypoxidaceae has near about 20 species of tropical origin. *Curculigo orchioides* is a geophilous, small, erect, perennial herb, 10-30cm tall, with stout or elongate tuberous rootstocks bearing several fleshy lateral roots. Leaves linear or linear-lanceolate, radical, sessile or petiolate, glabrescent; flowers bright yellow, in small racemes. Fruits capsules, 1-4 seeded with a slender beak, seeds black, oblong, deeply grooved in wavy lines (Kocyan, 2007).

Curculigo orchioides is commonly known as Kalimusli in Hindi, Talamuli in Sanskrit (Kirtikar and Basu, 1988; Thomas *et al.*, 2008). It was first introduced in 'Charak Samhita' of 'Agnivesha', the epic article of the medicine school of thought of the Hindu system of medicine (Agrahari *et al.*, 2010). Generally it is a found throughout India, eastward to Southward predominantly in subtropical region of Central Himalaya and Western ghats (Thakur *et al.*, 1998; Satyavati *et al.*, 1976). It is used as a significant constituent in various Ayurvedic and Unani compound formulations (Singh, 1973; Kumar *et al.*, 1997). Hence

*Corresponding Author:

Mr. Kishor B Theng,

Department of Botany,

Shri Shivaji Science and Arts College Chikhli,

Buldana, Maharashtra, India.

present study was carried out on tuberous root of *Curculigo orchioides* to analyze the presence of different phytochemical constituents in this crude drug.

MATERIALS AND METHODS

Collection of plant materials

Tuberous root of *Curculigo orchioides* were collected during August-September 2013 from Ambabarwa forest area of Buldana District, Maharashtra, India. The plant was identified by using various floras and herbarium specimen was deposited at Department of Botany, Shri Shivaji Science and Arts College Chikhli. The tuberous roots were thoroughly washed with water to remove foreign organic matter; shade dried and then grinds into fine powdered by using mechanical grinder.

Extraction of plant drug

The fine powder of root tubers was subjected to extraction in soxhlet apparatus. Root tubers powder was successively extracted with petroleum ether, chloroform, ethanol and acetic acid. Each time before extracting with next solvent, the powder residue was dried properly. Extract obtained in each solvent was separately concentrated, solidified and used for preliminary phytochemical analysis and physicochemical characterizations (Brain and Turner 1975; Harborne; 1994; Trease and Evans 1996; Khandelwal 2001; Kokate 2010). Each extract was also examined for its colour, consistency and weighed for calculating its percent yield in terms of air-dried powdered material. (table 1)



Table 1: Successive solvent extract shows color, yield percent and nature of *Curculigo orchoides* root tuber

S.No.	Solvent extract	Colour	Consistency	Yield percent
1	Petroleum ether	Light brown	lumpy	8.5%
2	Chloroform	yellowish	sticky	2.7%
3	Ethanol	yellowish	sticky	11.8%
4	Acetic Acid	Dark brown	semisolid	5.8%

Phytochemical Screening

For preliminary phytochemical analysis each extract of tuberous root was subjected to various qualitative chemical tests and determine the presence of different phyto-constituents like alkaloids, carbohydrates and glycosides, saponins, proteins and amino acid, phenolic compound and tannins, flavonoids etc. (table 2)

Physicochemical Analysis

Physicochemical analysis of powder was carried out by using different parameters such as total ash value, acid insoluble ash, water soluble ash, extractive value and moisture content. (table 3)

Table 3: Physicochemical analysis of *C. orchoides* root tuber:

S.No.	Physicochemical parameters	Values (in %w/w)
1	Total ash value	7.66%
2	Water soluble ash value	5.86%
3	Acid insoluble ash value	1.7%
4	Moisture content	8.46%
5	Alcohol soluble extractive value	10.8%
6	Water soluble extractive value	19.65%

Fluorescence analysis of successive extracts: (Chase and Pratt, 1949; Kokoshi et al., 1958).

Fluorescence analysis was carried off all extracts as well as powder by using different solvents and observed in visible rays and UV rays (for both short & long wave length). (table 4)

Table 4: Fluorescence analysis of powdered and different extract of *C. orchoides* root tuber:

S.No.	Extract / Powder	Visible light	U.V. light	
			Short wave (254nm)	Long wave (366nm)
1	Pet. ether extract	Light brown	Light green	Dark green
2	Chloroform extract	Light yellow	Light yellow	Blackish brown
3	Ethanol extract	yellowish	Golden yellow	Light green
4	Acetic acid extract	Dark brown	Dark Green	Brownish black
5	Powder as such	Light brown	Light green	Dark Green
6	Powder + D. water	Dark brown	Yellowish green	Dark Green
7	Powder + Conc. HCL	Light brown	Dark brown	Blackish brown
8	Powder+ Conc. H ₂ SO ₄	Black	Dark brown	Blackish brown
9	Powder + Methanol	Light brown	Light green	Dark green
10	Powder + FeCl ₃	Greenish Yellow	Greenish Yellow	Blackish
11	Powder + Picric acid	Yellowish green	Greenish Yellow	Greenish black
12	Powder + NaOH	Brown	Brown	Dark brown

Table 2: preliminary phytochemical analysis of *C. orchoides* root tubers extracts

S.No.	Test For Phytochemical	Test	Pet. ether extract	Chloroform extract	Ethanol extract	Acetic acid extract
A	Alkaloids					
1		Dragendorff's Test	+	+	+	+
2		Hager's Test	+	+	+	+
3		Mayer's Test	-	+	+	-
4		Wagner's Test	+	+	+	+
B	Carbohydrates and Glycosides					
1		Fehling's Test	-	+	+	-
2		Molisch's Test	+	+	+	+
3		Lieberman- Burchards Test	+	-	+	-
4		Borntrager's Test	+	+	+	+
5		Legal's Test	-	+	+	-
C	Saponins					
1		Foam Test	+	+	+	-
D	Phenolic compounds and Tannin					
1		Ferric chloride Test	+	-	+	-
2		Lead acetate Test	-	+	+	-
E	Proteins					
1		Millon's Test	+	-	+	-
2		Biuret's Test	+	+	+	-
F	Amino Acid					
1		Ninhydrin Test	-	-	+	-
G	Phytosteroids					
1		Lieberman- Burchards Test	+	-	+	-
2		Salkowski Test	+	-	+	-
H	Test for flavonoids					
1		Alkaline reagent test	+	-	+	+
I	Test for Gums and Mucilage					
1		Alcohol test	+	-	+	-
J	Fixed oil and Fats					
1		Soap test	+	-	+	-

Where, + = present and - = absent.

RESULT AND DISCUSSION

During phytochemical analysis ethanol showed higher percentage yield (11.8%) than petroleum ether (8.5%), acetic acid (5.8%) and chloroform (2.7%). Preliminary phytochemical analysis of *Curculigo orchioides* root tubers was done in petroleum ether, chloroform, ethanol and acetic acid extracts confirmed the presence of carbohydrates and glycosides, alkaloids, saponins, phenolic compounds and tannin, proteins, amino acid, phytosteroids, flavonoids, gums and mucilage, fixed oil and fats, etc.

Physicochemical parameters of *Curculigo orchioides* root tubers like ash values such as total ash, water soluble ash, acid insoluble ash, moisture content, alcohol soluble extractive value and water soluble extractive value were determined as 7.66%, 5.86%, 1.7%, 8.46%, 10.8% and 19.65% respectively. Fluorescence analysis of powder was carried out by using different chemicals under visible and UV light (at 254nm and 366nm) revealed the presence of various active agents in the tuber by their colour reaction with different chemicals.

CONCLUSION

Presence of different phytochemical constituents in root tuber confirmed it's used as nutritive tonic for strength, as an analgesic, aphrodisiac, immunostimulant, hepatoprotective, antiasthmatic etc. in traditional medicine. Physicochemical analysis helps in determining pharmacopoeial standard of crude drugs. The fluorescence helps in characterization and identification of crude drugs in powder form.

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