
Studies on Pharmacognostical features of *Curcuma domestica* Val.

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Abstract

The microscopic and macroscopic characters of the rhizome of *Curcuma domestica* Val. were studied. The behavior of the powdered drug in the presence of various chemicals was also studied. Preliminary phytochemical screening on the various extracts of the rhizome was done in order to ascertain the various chemical constituents present. These studies were carried out to identify this plant for future research work.

Introduction

Curcuma domestica Val. (Family: Zingiberaceae; synonym: *Curcuma longa* Linn.) is a perennial plant with roots or

tubers oblong-palmate and deep orange inside. Leaves about 2 feet long, lanceolate long, petioled, tapering at each end, smooth and of a uniform green colour. Flowers are funnel shaped, dull yellow, three or five together surrounded by bracteolate. It is propagated by cuttings from the root. In fresh state, the roots have an aromatic and spicy fragrance, which by drying give way to a more medicinal aroma (1).

It is known as Turmeric or Indian saffron (English), Huldee (Hindi), Hullud (Bengali), Uruk-uz-safr (Arabian), Kurkum (Persian), Haridra (Sanskrit), Gelbwurtz or Gilbwurtz (German), and Yu-chin or Kiang-hoang (Chinese). Because of ancient trade, the origin of Turmeric cannot accurately be

reconstructed, probably South-East Asia, i.e., a native of India and Indonesia. Other known species of *Curcuma* are *Curcuma xanthorrhiza* (Japanese turmeric), *C. zedoaria* (Zedoary), *C. wenyujin* and *C. amada* (2).

Turmeric is a very important herb in Ayurvedic medicine. As symbol of prosperity, it was considered as a cleansing herb for the whole body. Medicinally, it was used as a digestive aid and for treatment of fever, infections, dysentery, arthritis and jaundice and other liver problems. Traditional Chinese physicians used it to treat liver and gallbladder problems, stop bleeding and treat chest congestion and menstrual discomforts. Turmeric has long been considered as an essential spice of the Indian and other ethnic cuisines. In India, turmeric is used for the treatment of anorexia, liver disorders, cough, diabetic wounds, rheumatism and sinusitis. It is a natural antibiotic, which also improves intestinal flora, inflammatory bowel syndromes (e.g., ulcerative colitis), chronic diseases, chronic hepatitis, chronic bronchial asthma, psoriasis, all inflammatory conditions, external acne, insect bites and sore eyes. It is currently being evaluated for its anticarcinogenic and antimutagenic properties (3, 4).

Considering the various therapeutic efficacy and usage in traditional practice, it was thought desirable to investigate some of its pharmacognostical parameters for further identification of the active material(s). The present investigation deals with studies on some important pharmac-

ognostical profiles of the rhizome in its powdered form.

Materials And Methods

Plant material

Whole plant of *Curcuma domestica* Val. was collected from the forest land of Jharkhand in September 2005 and was identified by Dr. S. Jha, Taxonomist of the Department of Pharmaceutical Sciences, Birla Institute of Technology, Mesra, Ranchi-835215, India. A voucher specimen [Ref No. SJAN 03/05] of the plant herbarium has been preserved in the laboratory for future reference. After collection the rhizomes were cut into small pieces and dried properly. The dried rhizomes were then ground to a coarse powder by passing through a 40-mesh sieve.

Reagents

All the reagents were of analytical grade and obtained from S. D. Fine Chemicals Ltd., Mumbai.

Methods

The macroscopic characters (color, size, shape, odor, surface, texture, taste) of the rhizome of the plant under study were observed (5). The powder microscopy of the rhizome was performed following the standard method (6). The physical constant values of the plant under study were determined by standard pharmacopoeial methods (7). The behavior of the powder drug with different chemical reagents was studied (8). Preliminary phytochemical tests for

the various extracts of the rhizome were performed by using specific reagents (6,9). Further the extractive values of the methanolic extract of the rhizome of *Curcuma domestica* were determined.

rhizome reveals the presence of the active constituents as reported in Table 4. The methanolic extract of the rhizome is found to be yellow in color and its yield value is 6.0 % w/w.

Results and Discussion

The macroscopic characters of the rhizome under study are shown in Table 1. The microscopical characters as observed with powdered rhizome showed the presence of abundant starch granules, cork cells, yellow colored oleoresin cells and wood elements. The various physical constant values of rhizome of the plant have been reported in Table 2. The behavior of the powder drug on treatment with different chemical reagents is presented in Table 3. Phytochemical screening of the

Conclusion

The various studies of *Curcuma domestica* Val. Rhizome including its microscopy and macroscopy, physical constant values, behavioral studies of the powder drug with different chemical reagents, preliminary phytochemical screening of the various extracts of the rhizome will definitely help in proper identification of its active constituent(s) and authentication of the plant and its powder form for further studies.

Table - 1.
Macroscopic characters of the rhizome of *Curcuma domestica* Val.

COLOR	: Orange-yellow.
SHAPE	: Irregular.
SIZE	: 1-2 cm thick and 6-11 cm long.
TEXTURE	: Rough.
TASTE	: Pungent and slightly bitter.
ODOUR	: Aromatic and spicy.

Table - 2.
Physical constant values of rhizome of *Curcuma domestica* Val.

CONSTANT	YIELD IN PERCENTAGE (%W/W)
Total ash	8.46
Acid insoluble ash	0.76
Foreign organic matter	0.43
Alcohol soluble extractive	7.36
Loss on drying	12.52

Table - 3.
Behavioral pattern of the powdered sample of *Curcuma domestica* rhizome on treatment with different reagents

CHEMICAL REAGENT	COLOR DEVELOPED
Powder as such	Yellow
Picric acid (saturated aqueous solution)	Yellowish
Concentrated nitric acid	Reddish
Nitric acid dilute	Light brown
Hydrochloric acid concentrated	Dark brown
Hydrochloric acid dilute	Light brown
Sulphuric acid concentrated	Brownish black
Glacial acetic acid	No change in color
Ferric chloride	Dark brown
Aqueous iodine solution	Blood red
Dilute sodium hydroxide	Light brown
Antimony trichloride	Brownish gray

Table - 4.
Preliminary phytochemical tests for various extracts of *Curcuma domestica* Val. rhizome

Type of extract	Alkaloids	Tannins	Glycosides	Steroids	Saponins	Reducing sugars
Methanol	+	-	+	+	-	+
Aqueous	+	-	+	+	-	+
Benzene	-	-	+	+	-	+
Pet. Ether (60°-80°)	-	-	+	+	-	+
Chloroform	+	-	+	+	-	+
Acetone	+	-	+	+	-	+

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