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# *Holarrhena antidysenterica* wall: A review

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**Abstract**
Medicinal plants are generating an ever-increasing amount of interest due to effectiveness, low cost and minimal side-effects associated with drugs derived from them. The plant of *Holarrhena antidysenterica* Wall. Belonging to the family Apocynaceae. It is commonly known as Tellicherry Bark (English), Kurchi (Hindi), Kutaja (Sanskrit), Kurchi (Bengali).It is a small deciduous tree or shrub with white flowers found in tropical and subtropical regions of Asia and Africa. In India, it can be found throughout the country, especially in deciduous forests of tropical Himalayas, at altitudes ranging from 900 to 1250 m. The plant of *Holarrhena antidysenterica* Wall, has traditional claims for dysentry, diarrhoea, fever, diseases of the spleen, piles, leprosy, chronic bronchitis, urinary discharges, boils, ulcers, wounds, regulate menstruation, astringent, appetizer and anthelmintic, skin diseases, bleeding piles etc.

**Keywords:** *Holarrhena antidysenterica*, Pharmacological Review, Plant information

## 1. Introduction
The use of herbal crude drugs, extracts and their remedies have significantly increased throughout the world and the green revolution in terms of herbal medicine has now achieved astonishing popularity [1]. Plants are potent healers because they promote the repair mechanism in a natural way. The demand of herbal drugs is increasing day by day in developed as well as in developing countries because they are safer and well tolerated as compared to allopathic drugs [2]. This review is a compilation of all available information on the various aspects of *Holarrhena antidysenterica* Wall.

## Plant Information
Botanical Name: *Holarrhena antidysenterica* Wall.
Family: Apocynaceae
Synonym: *Holarrhenapubesens*

## Vernacular Names [3]
English: kurchi, tellicherry
Hindi: karchi, kura
Sanskrit: kutaja
Bengali: kurchi, khureya
Tamil: kashappu, vetpalarishi, kudasapalai.

## Taxonomical Status
Kingdom: Plantae (plants)
Super Kingdom: Tracheobionta (Vascular plants)
Super Division: Spermatophyta (Seed plants)
Division: Magnoliophyta (flowering plants)
Class: Magnoliopsida (Dicotyledons)
Sub Class: Asteridae
Order: Gentianales
Family: Apocynaceae
Genus: Holarrhena R.Br
Species: *antidysenterica*

## Plant Description [4]

### Leaves

Type: Compound leaves
Shape: Lanceolate
Size: Length is 10-20 cm; width is 5-7cm;
Margin: Entire
Apex: Acuminate
Base: Symmetrical
Colour: Upper surface green in color, Lower surface pale green in color
Venation: Reticulate venation

### Bark

Colour: Outer surface is buff-brownish, Inner surface is brownish

Shape: Small recurved pieces
Odour: Odourless
Taste: Bitter
Fracture: Short and granular

**Flowers**

Colour: White in colour
Pedicles: Slender, small bracts
Odour: No characteristic odour
Type: Acute, ciliate

**Seeds**

Color: Brown in color
Length: 5-8mm in length
Shape: Linear, oblong

**Chemical constituents [3]**
Steroidal alkaloids, Wrightine, Conessine, Karchisine.

**Habitat**
It is Dwarf tree. Found in Tropical and sub-tropical regions of Asia and Africa.
Deciduous forests of tropical region of Himalayas at an altitude of 900-1250m.

**Ethnobotanical Uses [4]**

- **Bark:** The barks are used for treating dysentry, diarrhoea, fever, piles, leprosy, skin diseases, diseases of the spleen,headache and as anthelmintic.

- **Leaves:** The leaves are used in the treatment of pain in the muscles, in chronic bronchitis, urinary discharges, boils, ulcers, wounds. They are also used to regulate menstrutation.

- **Seeds:** The seeds are used as appetiser, astirngent, anthelmintic and to cure pain, leprosy, burning sensation, dysentry, skin disaeses, bleeding piles.

- **Flowers:** The flowers are used as an appetizer and anthelmintic. They are also used to cure biliousness, diarrhoea, diseases of the blood, leucoderma.

**1. Pharmacognostical and Phytochemical Review**
Evaluation of the pharmacognostical and phytochemical studies on their leaves, bark, seeds of *Holarrhena antidysenterica* Wall [5].

**2. Pharmacological Review**
**Cytotoxic activity**
The *in vitro* cytotoxic activity of extracts of leaves of *Holarrhena antidysenterica* Wall., was carried out against some human cancer cell lines. Cytotoxic activity was found in the chloroform soluble fraction of 95% ethanolic extract which showed an inhibition of growth at 100µg/ml [6].

**3. Anti-malarial activity**
Anti-malarial property of steroidal alkaloid conessine isolated from the bark of *Holarrhena antidysenterica* Wall was reported. Conessine exhibited substantial antimalarial property [7].

**4. Antihyperglycemic and Antihyperlipidemic activity:**
The antihyperglycemic and antihyperlipidemic effects of methanolic extract of *Holarrhena antidysenterica* Wall., bark in alloxan induced diabetes mellitus in rats were performed. It was concluded that methanolic extract of *Holarrhena antidysenterica* Wall., possesses antihyperglycemic activity with antihyperlipidemic and antioxidant potential which may prove beneficial in cardiovascular complications associated with diabetes mellitus [8].

**5. Anti-urolithic activity**
The crude extract of *Holarrhena antidysenterica* Wall., was evaluated forpossible antiurolithic effect. The crude aqueous-methanolic extract of *Holarrhena antidysenterica* Wall., was studied using the *in vitro* and *in vivo* methods [9].

**6. Anti-diuretic activity**
An *in-vivo* diuretic effect on the seeds of *Holarrhena antidysenterica* Wall., was done. It possessed antidiuretic activity and it has been postulated that the diuretic effect is mediated by its saluretic activity [10].

**7. Anti-inflammatory activity**
Anti-inflammatory activity in the methanolic extract of bark of *Holarrhena antidysenterica* Wall., has been reported. The extract shows a decrease in nitric oxide and malondialdehyde levels and increased levels of superoxide dismutase and glutathione levels in 2, 4-Dinitrobenzene sulfonic acid induced colitis in male albino wistar rats. The rats also resisted rupture of goblet cells, inflammation in mucosal layers and inflammatory cellular infiltration [11].

**8. Antioxidant activity**
The antioxidant potential of *Holarrhena antidysenterica* Wall., methanolic leaf extractusing hydroxyl radical superoxide anion and reducing power assay was performed. The extract showed

significant reactive oxygen species (ROS) scavenging activity [12].

**9. Gut motility**

The hydro-ethanolic extracts of bark of *Holarrhena antidysenterica* Wall., isuseful in gut motility disorders such as constipation, colic and possibly diarrhea [13].

**10. Antifungal activity**

The methanolic bark extract of *Holarrhena antidysenterica* Wall., shows good antifungal activity against C*andida albicans* [14].

**11. Analgesic activity**

The methanolic extract of the bark of *Holarrhena antidysenterica* Wall., shows analgesic activity on Swiss albino rats and wistar rats [15].

**12. Antidiarrhoeal activity:**

*In-vitro*antidiarrhoeal activity on the ethanolic and aqueous extracts of bark of *Holarrhena antidysenterica Wall.,* [16]

**13. Anti-mutagenicity activity**

Anti-mutagenicity activity in the bark of *Holarrhena antidysenterica* Wall., has been reported. Their potency in sodium azide and methane sulphonate induced mutagenicity was demonstrated against the strains of S*almonella typhimurium* [17].

**14. Antihypertensive activity**

The anti-hypertensive activity of the seeds of *Holarrhena antidysenterica* Wall., has been reported. The ethanolic seed extract of *Holarrhena antidysenterica Wall.,* showed 24% inhibition of angiotensin converting enzyme (ACE) [18].

**15. Anti-haemorrhoidal action**

Stem bark of extract of *Holarrhena antidysenterica* Wall., in the form of "Kutajatvakchurna" showed healing activity in patients suffering from bleeding piles [19].

**16. Hepatocellular protective effect**

The ethanolic extract of bark of *Holarrhena antidysenterica* Wall., afforded a significant protective action in CCl4-induced hepatocellular injury [20].

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