



# INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

## Pharmacognosy of cinchona

Vishal Prajapati, Pyiush Yadav, Ajeet Kumar Kannaujiya, Ravikant Vishwkarma, Akshay Pratap Yadav

Department of pharmacy, Prasad Institute of Technology, Jaunpur (UP) , India

### ABSTRACT

The near about 350,000 species of plants are found in the earth and these plants have the great medicinal value. The plant of Cinchona is also known as Jesuit's bark, Peruvian bark and cinchona bark which is belong from the family of Rubiaceae. It produces the yellowish to green colored in short ruptur to outer surface and which is inner surface is yellow, brown, deep reddish to brown colored, different-2 species inner surface of color is different. The cinchona bark are the consist of 30 types of alkaloids, which belong to quinoline group but mainly quinidine, quinine, cinchonina and cinchonidine are the play the vital role in medicinal field. Quinine are mainly used to treatment of malaria and other alkaloids are producing the various medicinal properties such as analgesic, antipyretic, protoplasmic, cardiac arrhythmia, dyspepsia, gastric catarrh and cardiac depressant.

### KEYWORDS

Introduction, Biological source, Geographical source, Botanical classification, Organoleptic property, Microscopic property, Cultivation and collection, Chemical constituents, Pharmaceutical uses

### INTRODUCTION

The cinchona is a larger shrub or small tree is domestic or born to South America. Cinchona bark is also known as Peruvian bark or Jesuit's bark, it is famous his medicinal properties. These are the contain various types of alkaloids such as Cinchonine, Cinchonidine, Quinine, Quinidine and Quinamine etc. It's most valuable alkaloids are the quinine used as antimalarial agent.[1] Cinchona is belong the family of Rubiaceae it consists of 23 species of trees and plant.[2]

*Cinchona pubescens* - flowers



## SYNONYMS [3]

- Jesuit's bark
- Peruvian bark
- Cinchona bark

**FAMILY** - Rubiaceae

## BIOLOGICAL SOURCE

It is cultivated by the dried bark or root of cinchona species like *Cinchona calisaya* Wedd., *C. Ledgeriana* Moens, *C. officinalis* Linn, *C. succirubra* Puv. ex – Klotzsch. [4][5]

## GEOGRAPHICAL SOURCE

Cinchona is found in various countries like India, Columbia, Ecuador, Peru, Tanzania, Guatemala, Indonesia, Bolivia and Sri Lanka. They are cultivated in West Bengal area in India like Annamalai hills (Coimbatore district) and Nilgiri hills (Nilgiri district) in Tamil Nadu and in Darjeeling. [6]

## BOTANICAL CLASSIFICATION [7]

Kingdom *Plantae* – Plants

Subkingdom *Tracheobionta* – Vascular plants

Superdivision *Spermatophyta* – Seed plants

Division *Magnoliophyta* – Flowering plants

Class *Magnoliopsida* – Dicotyledons

Subclass *Asteridae*

Order *Rubiales*

Family *Rubiaceae* – Madder family

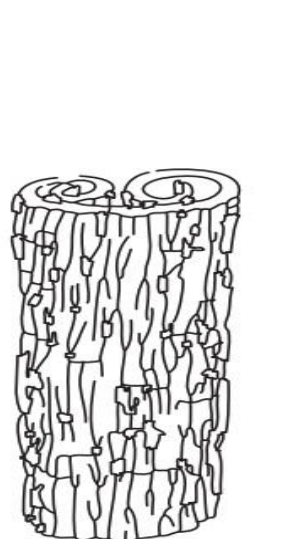
Genus *Cinchona* L. – cinchona P

Species *Cinchona officinalis* L. – quinine P

## ORGANOLEPTIC PROPERTIES



Ledgeriana

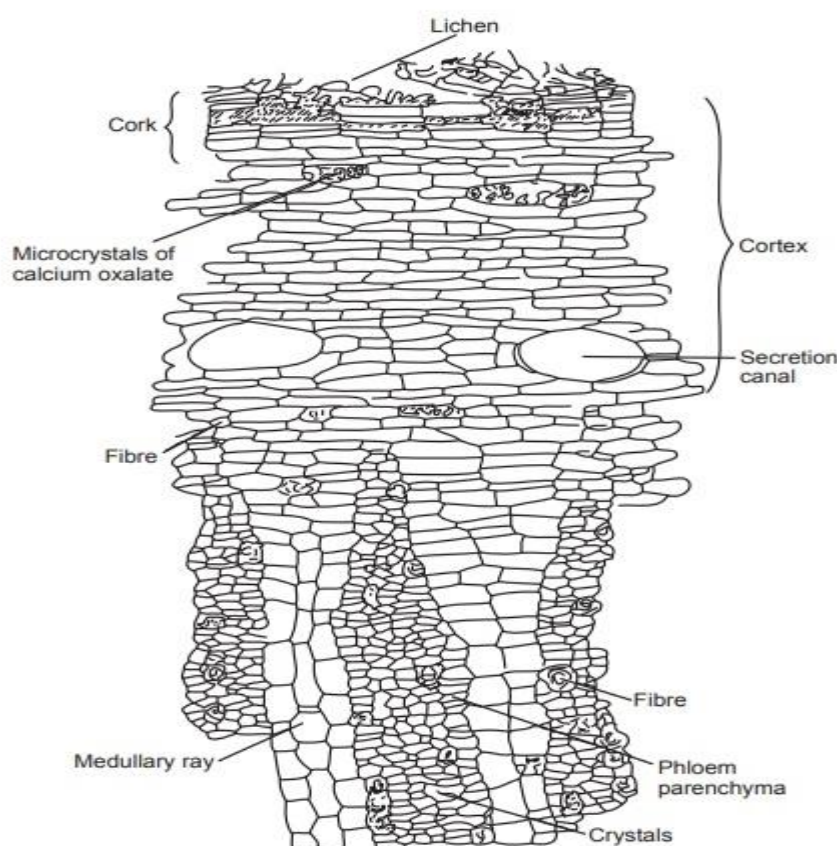


Twig and bark of Cinchona

- Its outer surface is the yellowish to green colored and they have color appear short ruptur.
- Its different species inner surface is differ.
- Its inner surface some colors like yellow , brown, deep reddish to brown.
- The tast of cinchona bark is highly bitter and astringen , its odour is distinctive.
- Its leave size is 10-40 cm long.[8]

## MICROSCOPIC PROPERTIES

Cinchona realistic characters show in the bark. The cork cell of cinchona are thin-walled, come after by phelloderm. The cortex of cinchona contains of several secretory channels and phloem fibers. Medullary rays with spiralling arranged cell is present. Idioblast of calcium oxalate are the fixed characteristic of cinchona bark. The parenchymatous tissues under the present the starch grains. Stone cells are infrequently present in the structure. These are a few cork cells is harder. Medullary rays are the broad in 2 to 3 cells.[9]



**Transverse section of Cinchona bark**

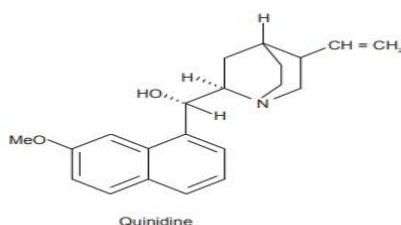
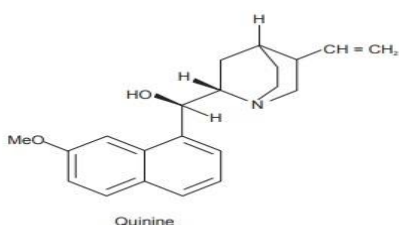
## CULTIVATION AND COLLECTION

Cinchona is cultivated by seed sowing method. The seed nearly by the 3mm long and flat are harvest and they are used for cultivation. The seed is scatter in the boxes and the seedlings is transfomed to nurseries they are gain 5cm height, the nurseries is protected by the ceiling covering from the direct sunlight contact. The seedlings grown under coolness they attain a height above 25cm and these period they are transplanted double. Cinchona is grows well at an height of 1500 – 2000m above sea level, temperature of rainfall of 200- 400cm. These plant is 1.5 years oldest these are transplanted in open space at a 1m distance into well drained , rich and porous soil.

The plant of cinchona grow upto six years and the first collection is collected by coppicing , uprooting or felling method. The cinchona bark is collected to the 9 years old plant because bark containing alkaloids decreases afterward. [10]

## CHEMICAL CONSITITUENTS

- Alkaloids are considerable chemical constituent of cinchona.
- Cinchona bark containing about 30 types of alkaloids, which belong to quinoline group.
- The important alkaloids of cinchona bark is quinidine, quinine, cinchonina and cinchonidine.
- These 4 chemical constituents are present in bark they are stereoisomers of each other.
- Cinchona may be present other chemicals like quiniarine, cinchotine, hydroquinine, hydrocinchonidine and cinchotannic acid.
- Methoxy group like quinidine and quinine is present but no methoxy group like cinchonine and cinchonidine is present.
- Starch grains and bitter glycosides is present in cinchona.
- They are also contain crystalline acid and calcium oxalate like quinic acid.
- The total alkaloids not less than 6.5 percentage in cinchona.
- The cinchona contains 30 to 60 percentage of quinine alkaloids.[8]



## PHARMACEUTICAL USES

- Cinchona is an official phytomedicine, which are used in the formulation of quinine from the cinchona species, these are used for anti-fever agents. It is very useful in prevention and treatment of malaria. Other alkaloids like cinchonine, cinchonidine, and quinidine are extracted from this tree.
- These also produce analgesic, antipyretic, and protoplasmic properties.
- These are used for bitter stomach and toxic.
- If the quinidine is producing cardiac depressant properties.
- They treat rheumatism and neuralgia.
- These are also used in the treatment of cardiac arrhythmia.
- These are also used as antiseptics and are also useful in diseases such as abscesses, cavities, and ulcers.
- These are also used in the treatment of dyspepsia and gastric catarrh.[11]

## CONCLUSION

In the review literature we are discussing for the cinchona. It is widely used in the pharmaceutical field. These contain various types of alkaloids like quinine, quinidine, cinchonine, and cinchonidine etc. They have antimalarial properties which have a vital role in the pharmaceutical field. Cinchona is popular for its antimalarial property but as well as it has analgesic, antipyretic, protoplasmic, rheumatism, neuralgia, cardiac arrhythmia, cardiac depressant properties.

## ACKNOWLEDGEMENT

I have expressed my special thanks for my dear respected professor which are provides a golden chance at each and every steps. I have thanks to all of that are directly and indirectly involved for completed this review paper . I have thanks to my parents which are also supported us.

## REFERENCES

- 1). [https://www.lib.cam.ac.uk/collections/departments/royal-commonwealth-society/projects-exhibitions/products-empire-cinchona#:~:text=The%cinchona %20-%20large%20shrub, renowned %20for %20properties.](https://www.lib.cam.ac.uk/collections/departments/royal-commonwealth-society/projects-exhibitions/products-empire-cinchona#:~:text=The%cinchona%20-%20large%20shrub,%20renowned%20for%20properties.)
- 2). "Cinchona (two pronunciations)". Merriam Webster, Incorporated 2019. Retrieved 20 September 2019.
- 3). <https://www.synonym.com/synonyms/cinchona-bark>
- 4). Tyler V.E., Brady L.R., and Robbers J.E, pharmacognosy, 9th edition, page no.204
- 5). Kokate C.K., Purohit A.P., Gokhale S.B., pharmacognosy, 42nd edition, page no. 13.54
- 6). kokate C.K., Purohit A.P., Gokhale S.B., pharmacognosy, 50th edition, page no. 15.58
- 7). <https://plants.usda.gov/java/ClassificationServlet?source=profile&symbol=CIOF&display=317>
- 8). [https://gpatindia.com/cinchona-biological-source-morphological-features-chemical-constituents-and-mcqs/.](https://gpatindia.com/cinchona-biological-source-morphological-features-chemical-constituents-and-mcqs/)
- 9). Kokate C.K., Purohit A.P., Gokhale S.B., pharmacognosy, 50th edition, page no 15.61
- 10). <http://www.pharmacy180.com/article/cinchona-145/#:~:text=Microscopic%20Characters&text=Idioblasts%2C%20containing%20micro-crystals%20of,%20large%20spindle-shaped%20lignified%20fibres.>
- 11). Goss, Andrew (2014). "Building the world's supply of quinine: Dutch colonialism and the origins of a global pharmaceutical industry". Endeavour. 38 (1): 8–18. doi:10.1016/j.endeavour.2013.10.002. PMID 24287061.