

# A Review on Plant Chirayta Swertia Chirata

Yukta Sharma<sup>1</sup>, Mr. Pardeep Kumar<sup>2</sup>, Dr. Abhishek Soni<sup>3</sup>, Dr. Chinu Gautam<sup>4</sup>

School of Pharmacy, Abhilashi University, Mandi, HP, India

[yuktasharma709@gmail.com](mailto:yuktasharma709@gmail.com)<sup>1</sup> [monu35908@gmail.com](mailto:monu35908@gmail.com)<sup>2</sup> [abhisoni.phd@gmail.com](mailto:abhisoni.phd@gmail.com)<sup>3</sup> [chinu990@gmail.com](mailto:chinu990@gmail.com)<sup>4</sup>

**Abstract:** *Swertia chirata* (Gentianaceae), is a popular medicinal plant native to temperate Himalaya. It is mainly found in the mountainous region of northern India, in favourable Himalayas at altitude between 1,200-3,000 m from Kashmir to Bhutan in hilly area in Meghalaya at 1,200-1,500 m. Plant of *Swertia chirata* is found at an altitude of 1200-1300m, from Bhutan to Kashmir and in the Khasi hills at 1200-1500 m(4). The length of the bark is about 1m long, externally it is yellowish or purplish brown in colour. The leaves are opposite sessile, and the colour of the fruit is yellowish brown and the odour is indistinct and the taste is very bitter in taste. The plant has many important pharmaceutical phytochemicals like xanthenes, ursolic acid, flavonoids, iridoids, terpenoids, glycosides, swertiamarin, ophelic acid secoiridoids Chrantin and ophelic acid are two major compounds present in it(20). People have been using traditional medicinal plant from several years. Traditional plants play a very important role in prevention and treatment of human diseases. Medicinal usage of *Swertia chirata* is reported in Indian pharmaceutical codex, the American and the British pharmacopoeias and in the different traditional systems of medicine (Unani, Ayurveda and Siddha). *Swertia chirata* is commonly known as a bitter tonic in traditional system of medicine for the treatment of fever, loss of appetite, digestive disorders, diabetes, skin and various other diseases(21).

**Keywords:** *Swertia chirata*, Anti-Malarial Activity, Blood Purifier, Chirayata

## I. INTRODUCTION

*Swertia chirata* is one of the most common and effective herbal medicine. Mainly it is known as different names in different areas such as Chirayata, Chiretta etc. Mainly it has different kinds of properties like anti-inflammatory, hepatoprotective, antibacterial, hypoglycaemic, wound healing antispasmodic, antioxidant, anti-diabetic, antipyretic as well as antitussive etc. (1)

In 1753 Linnaeus founded the Genus of *swertia* in respect of Emanuele Sweert, who is a gardener, covered around 170 similar species of Chirayata which are mainly inhabitant to the northern hemisphere of temperate regions (2).

In accordance with WHO around 80% of the population of world rely on herbal plants which have medicinal properties for their primary health care need and as a basic medicine at any place (3).

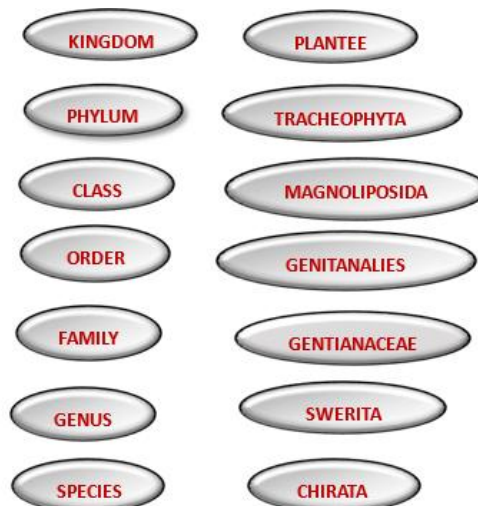
It is traditionally used for the inducement of appetite and respiratory disorder (asthma). It is briefly explained in Ayurveda and Unani system of medicine and also described in pharmacopoeias those pharmacopoeias are American and British pharmacopoeias (1).

Also having antimicrobial activity against gram-negative and +ve bacteria. In the Unani system it is used as an astringent, heart tonic and skin problem treatment, etc. It is also used to treat malaria. It is also beneficial for intestinal worm (2). In some case it is used as a blood purifier. It is widely available in Himalayan zones; mainly it is available in Kashmir (3).



## II. TAXONOMY

Taxonomical classification of Swertia Chirata(4)



## III. MORPHOLOGY

The Colour of the flower of chirata is greenish-yellow, and the stem is purple in colour. The Height of the whole plant is about 1 m and the diameter is about 6 mm. The shape of the lower part of the plant is cylindrical, and the upper part is quadrilateral(5). The Bases of the leaves are broad and in acauline shape. The Flower of chirayta is yellowish-green and has a purplish shade inside of it. The fruit is ovoid in shape. Seeds of this plant are very little and dark brownish in colour. It is bitter in taste(6).

## IV. DISTRIBUTION

It is mainly found in the mountainous region of northern India, in favourable Himalayas at altitude between 1,200-3,000 m from Kashmir to Bhutan in hilly area in Meghalaya at 1,200,1,500 m(4). It is cylindrical from its base, wood of the stem is permeable yellow. The length of the bark is about 1m long, externally it is yellowish or purplish brown in colour(7). The leaves are opposite sessile, and the colour of the fruit is yellowish brown and the odour is indistinct and the taste is very bitter of this plant. All parts of the chirata plant are useful for therapeutic purposes(8).

### Microscopic:

The inner tissue (parenchyma) of leaves contains many chloroplasts, and it shows very little differentiation of the mesophyll tissue (9). The epidermis is single layered and covered outwardly with a thick-lined cuticle which is more developed on the upper surface than on the lower one. By looking with naked eye it shows the upper epidermis cells have straight walls and are larger than the lower epidermis cells which show sinus outline. Stomata are of cruciferous type and found only on the lower surface (10)

## V. CHEMICAL CONSTITUENTS

The plant has many important pharmaceutical phytochemicals like xanthenes, ursolic acid, flavonoids, iridoids, terpenoids, glycosides, swertiamarin, ophelic acid secoiridoids Chrantin and ophelic acid are two major compounds present in it. These are reasonable for its bitter taste. The ophelic acid is yellow in colour and non-crystalline and it is dissolved in water alcohol and ether (20). The root of such medicinal herb is simple, yellowish in colour, somewhat oblique, almost 7–8 cm long whereas flowers look small, numerous, tetramerous and green-yellowish in colour(21).



## **VI. NUTRITIONAL VALUE**

The whole plant is mainly used to treat hepatic disorder, inflammation, and digestive disease.

Mainly the plant is used to treat:-Fever, Malaria, Anemia, Bronchial asthma, Hepatotoxic disorders. Whole plant and root used in several traditional systems of medicines, such as Ayurveda, Unani, and Siddha. Also used in British and American Pharmacopeia. Also used to treat Skin diseases such as eczema and pimples (1). Liver disorders; stomach disorders like dyspepsia and diarrhea, intestinal worms etc (1). Used in combination with other drugs in cases of scorpion bite (22). Traditionally, decoctions of this species are used for anthelmintic, hepatoprotective, hypoglycemic, antimalarial, antifungal, antibacterial, cardiostimulant, antifatigue, anti-inflammatory, antidiarrheal, as protectant of the heart and also help in lowering blood pressure and blood(22). The curative value of this herb has also been recorded in ancient Ayurveda medicine systems and other conventional medical systems (22).

## **VII. CONCLUSION**

This plant is the reservoir of various active phytoconstituents. These are the main cause to explore different pharmacological properties against various ailments (21). In the Unani system of medicine, the plant is explored in the form of tonic and used as a potent blood purifier. The finding of the study revealed that the *Swertia Chirata* manifests an advantageous role in the medication of various common deadly disorders prevailing in India (22). Further research needed to be done on the characterization, identification of novel, natural bioactive molecules, mechanism of action, and efficacy should be tested against other deadly diseases (23).

## **REFERENCES**

1. Aleem A, Kabir H. Review on *Swertia chirata* as traditional uses to its phytochemistry and pharmacological activity. *J Drug Deliv Ther.* 2018 Sep 2;8(5-s):73-8
2. Misra A, Shasany AK, Shukla AK, Darokar MP, Singh SC, Sundaresan V, Singh J, Bagchi GD, Jain SP, Saikia D, Khanuja SP. AFLP markers for identification of *Swertia* species (Gentianaceae). *Genet Mol Res.* 2010 Aug 10;9(3):1535-44
3. Bhatt A, Rawal RS, Dhar U. Ecological features of a critically rare medicinal plant, *Swertia chirayita*, in Latif A, Rehman S. STANDARDIZATION OF A HERBAL MEDICINE SWERTIA CHIRAYITA LINN. Dey P, Singh J, Himalaya. *Plant Species Biology.* 2006 Apr 1;21(1)
4. Suluvoy JK, Dilip KJ, Nayak J. Utilization of *Swertia chirayita* plant extracts for management of diabetes and associated disorders: present status, future prospects and limitations. *Natural Products and Bioprospecting.* 2020 Dec;10(6):431-43
5. Mehta A, Raina R, Rana RC, Pal Y. Comparative morphological studies of some *Swertia* species. *J Pharmacogn Phytochem.* 2017;6(1):482-7
6. Luo B, Tong Y, Liu Y, Zhang Y, Qin Y, Hu R. Ethnobotanical insights into the traditional food plants of the Baiku Yao community: a study of cultural significance, utilization, and conservation. *Journal of ethnobiology and ethnomedicine.* 2024 May 16;20(1):52
7. Shi GF, Wang GY, Chen XF. Screening of radical-scavenging natural neuroprotective antioxidants from *Swertia chirayita*. *Acta Biologica Hungarica.* 2013 Sep 1;64(3):267-78
8. Gargi Nag GN, Sukriti Das SD, Susmita Das SD, Suvra Mandal SM, Bratati De BD. Antioxidant, anti-acetylcholinesterase and anti-glycosidase properties of three species of *Swertia*, their xanthenes and amarogentin: a comparative study
9. Mehta A, Raina R, Rana RC, Pal Y. Comparative morphological studies of some *Swertia* species. *J Pharmacogn Phytochem.* 2017;6(1):482-7
10. Barua A, Choudhury P, Mandal S, Panda CK, Saha P. Anti-metastatic potential of a novel xanthone sourced by *Swertia chirata* against in vivo and in vitro breast adenocarcinoma frameworks. *Asian Pacific Journal of Cancer Prevention: APJCP.* 2020 Oct;21(10):2865



11. Panthari D, Saklani K, Chandra S, Ghosal P, Saklani S, Purohit VK. Exploring Swertia: Ethnobotanical Insights, Medicinal Potential, and Conservation Strategies
12. Shi GF, Wang GY, Chen XF. Screening of radical-scavenging natural neuroprotective antioxidants from Swertia chirayita. *Acta Biologica Hungarica*. 2013 Sep 1;64(3):267-78
13. Kaloo MA, Bhat BA. Chemical composition and pharmacology of a medicinal herb: Swertia chirata. *Int Pharm Sci* 2020; 11: 105. doi: 10.31531/2231-5896.10001062 Chemical constituents of Chirata. 2020
14. Ahirwal L, Singh S, Dubey MK, Bharti V, Mehta A. Investigation of Antioxidant Potential of Methanolic Extract of Swertia chirata Buch. Ham. *European Journal of Medicinal Plants*. 2014 Nov 1;4(11):1345
15. Sayyed M, Khan M, Devanna N, Syed YH, Ansari JA. Pharmacognostical and phytochemical investigations of the whole plant of Swertia chirata and Hemidesmus indicus. *Journal of Pharmaceutical and Biosciences*. 2013;4:141-5
16. Mallikarjun N, Mesta SC, Sudharshan SJ, Vinayaka KS. Antimosquito (Insecticidal) activity of extracts of Hemidesmus indicus and Swertia chirata against Aedes aegypti mosquito larvae-A Comparative Study. *Drug Invent Today*. 2010 Feb 1;2:106-8
17. Pant M, Bisht P, Gusain MP. In vitro propagation through root-derived callus culture of Swertia chirata Buch.-Ham. ex Wall. *African Journal of Biotechnology*. 2012;11(29) 18) Hoq MO. Medicinal importance of Swertia chirayita in Unani system of medicine. *International Journal of Unani and Integrative Medicine*. 2018;2(2):47-51
18. Hossain MS, Chowdhury ME, Das S, Chowdhury IU. In-vitro thrombolytic and antiinflammatory activity of Swertia chirata ethanolic extract. *Journal of Pharmacognosy and Phytochemistry*. 2012 Nov 1;1(4):99-104
19. Dey P, Singh J, Suluvoy JK, Dilip KJ, Nayak J. Utilization of Swertia chirayita plant extracts for management of diabetes and associated disorders: present status, future prospects and limitations. *Natural Products and Bioprospecting*. 2020 Dec;10(6):431-43
20. Khan MA, Zia M, Arfan M, Nazir A, Fatima N, Naseer M, Khan SA, Ismail T, Alkahraman YM, Murtaza G, Mannan A. Antioxidants, antimicrobial and cytotoxic potential of Swertia chirata. *Biomed Res*. 2018;29(13):2722-6
21. Kumar V, Van Staden J. A review of Swertia chirayita (Gentianaceae) as a traditional medicinal plant. *Frontiers in pharmacology*. 2016 Jan 12;6:308
22. Parthraj Kshirsagar PK, Jaykumar Chavan JC, Mansingraj Nimbalkar MN, Shrirang Yadav SY, Ghansham Dixit GD, Nikhil Gaikwad NG. Phytochemical composition, antioxidant activity and HPLC profiles of Swertia species from Western Ghats

