



## Review on swertia chirata as traditional medicine

Sakshi Pandey\*, Sakshi Sharma, Kriti Joshi

Faculty of Agriculture and Veterinary Sciences, Jayoti Vidyapeeth Women's University, Jaipur, Rajasthan, India

### Abstract

Many herbs recognized to have medicinal properties and many beneficial effects on health. Swertiachirata is one such herb, belonging to the family Gentianaceae, it also has many potential health benefits. It has been reported to have several pharmacological effect such as antimicrobial, anti-inflammatory, anti-cancer and analgesics. Humans from very long have been using traditional medicinal plants. Traditional plants play a very important role in preventing and treating of human diseases. Medicinal usage of Swertiachirata is reported in Indian pharmaceutical codex, the American and the British pharmacopoeias and in the different traditional systems of medicine (Unani, Ayurveda and Siddha). Swertiachirata is commonly known as a bitter tonic in the area of traditional medicine, due to the presence of many bioactive components, it tastes bitter but directly associated with human health welfare like used for the treatment of fever, loss of appetite, digestive disorders, diabetes, skin and various other diseases.

**Keywords:** antimicrobial, anti-inflammatory, anti-cancer, antioxidants

### Introduction

The use of herbs, herbal extracts or plant derived pure chemicals is a new therapeutic approach to treat different diseases, which has gained immense popularity. Especially in Asian countries and mostly in India, plants have been traditionally used for human and veterinary health care. World population uses around 35,000-70,000 species of plants for medicinal, nutraceuticals and/or cosmetic purpose. At present all over world, there is an increased interest in plant drug extracts, and this is due to several reasons, specifically, synthetic medicine can be inefficient, abusive and or incorrect use of these drugs results in deleterious side effects whereas drugs obtained from natural plant origin are non-narcotic, having no or fewer side effects and are cost effective. These plants contain wide array of chemical compounds which play an important role in health care. The Indian system of medicine including Ayurveda, Siddha, Unani and even Homeopathy rely on plant based crude materials and their formulations. (J.Crank, 2009).

There is increased demand for herbal drugs and/or their principal chemical constituents by pharmaceutical, phytochemical and perfumery industries. Hence these medicinal plants are often adulterated by foreign organic matters resembling the standard drugs or are substituted by inferior quality crude drugs. Therefore, it is essential to study and establish a systematic pharmacognostic and phytochemical profile of such medicinally valuable plants. (L Fand, 2011) Swertia, commonly Known as Chirata has been mentioned as a potent herbal drug in Indian traditional system Chirata is one of the most reputed herbal drugs used extensively for the treatment of chronic fever, malaria, anemia, bronchial asthma, liver disorders, hepatitis, gastritis, constipation, dyspepsia, skin diseases, worms, epilepsy, ulcer, scanty urine, hypertension, melancholia and certain type of mental disorder, secretion of bile, blood purification and diabetes. Swertiachirata is a blue flowering plant and used in therapeutic herbal preparation. It is extremely bitter and because of that has many healing benefits. (L.Das and Raychaudharuri, 2012)<sup>[6]</sup>.

The use of herb or plant derived pure chemical is a new the Rapeutice approach to treat different disease. Swertiachirata has antidiabetic action it comes into play when the blood

sugar level are higher thannormal. It's has a strong anti-inflammatory affect. It corrects the nutritional disorder in the body. (K Naito, 2000)

The plant Sweatiachirata is selected to investigate for its immune modulatory and antioxidant activity based on the following evidences:

- Swertiachirata is an ingredient of Ayurvedic formulation called Rasayana.
- Rasayanas are a group of non-toxic polyherbal drug preparation. Which are immunomodulatory and there by prevent the causation of disease and promote health and longevity.
- Swertia chirata contains chemical constituents such as triterpenoids (oleanolic acid and ursoilic acid) and iridoid glycosides (Amaroswerin and Amarogentin). The chemical constituents such as terpenoids and iridoid glycosides present in the Plantago major L. leaves have been reported for their antioxidant and immunomodulating activity.
- The biological activities of triterpenoids have attracted more attention in the biochemical and medical fields because of their immunomodulatory and tumors effect. (B. Elish and Gell, 2004).

### Botanical Description

*S. chirayita* is an annual/biennial herb 0.6–1.5 m tall. It has an erect, around 2–3 ft long stem, the middle portion is cylindrical, while the upper is quadrangular, with a prominent decurrent line at each angle. Its stem is orange brown or purplish in color with large continuous yellowish pith (Bentley and Trimen, 1880; Joshi and Dhawan, 2005)<sup>[3, 11]</sup>.

The root is simple, yellowish, somewhat oblique, or geniculate, tapering and short, almost 7–8 cm long and usually half an inch thick (Bentley and Trimen, 1880; Scartezzini and Speroni, 2000)<sup>[3, 21]</sup>. Flowers are small, numerous, tetramerous, large leafy panicles, green-yellow, and tinged with purple and green or white hairs (Scartezzini and Speroni, 2000; Joshi and Dhawan, 2005)<sup>[21, 11]</sup>.

### Period of Occurrence

The plant is quickly spreads from seed which is shed during October and November. Herbs can be cultivated in suitable localities in the temperate Himalayas. Seeds are very small in size, should be sown in nursery and seedlings transplanted later in the field (Anonymous (1992) <sup>[1]</sup>.

**Table 1:** Plant Profile

Family	Gentianaceae
Unani name	Chirata
Hindi name	Chirayata
Trade name	Chirayata
Ayurvedic name	Kiratatika
Parts used	Whole plant

Kirtiker K. B. *et al.*, (1996).

### History

Swertiachirata goes all the way back to Sanskrit times and is mentioned in the charaka Samhita an ancient ayurvedic healing text from India. Swertiachirata was first brought to Europe in 1839 and has been used ever since. (J. Nilson, 2017)

**Table 2:** Scientific Classification

Kingdom	Plantae
(unranked)	Angiosperms
(unranked)	Eudicots
(unranked)	Asterids
Order	Gentianales
Family	Gentianaceae
Genus	Swertia L.

(Kumar V *et al.*, 2016) <sup>[15]</sup>



**Fig 1:** Swertiachirata plant (Kumar V *et al.*, 2016) <sup>[16]</sup>

### Cultivation

Medicinal plants distributed across Himalayas are normally slow growing and takes long period of 2-3 years to complete the life-cycle. Commercial consumption has threatened the availability of medicinal plants in the Himalayas. The cultivation of medicinal plants is inevitable to feed the rising demand of industry. Keeping in view the demand and threat to this valuable resource, efforts were made to develop ex-situ propagation techniques and agro-technology package for commercial cultivation of selected Himalayan species. During last one decade success was achieved in standardization of agro technology package for commercial cultivation of *Swertia* species. Commercial cultivation of Chirata (*Swertia*) was initiated with active participation of local women in their revenue land for diversification of agriculture and livelihood. Women were trained in sowing, weeding and maintenance of the crop. Cultivation practices were free of chemical fertilizers and farmers used vermicompost to meet nutritional requirements. All women

cultivating Chirata were provided vermiculture to prepare vermicompost. Women/farmers involved in cultivation of Chirata were regularly monitored on day to day basis through visit and personal contact to understand and solve their problems. Observation of the performance of the crops own in 2009 revealed that around 400 farmers out of 507 harvested around 2,500-3,000 Kg first crop for marketing. Commercial cultivation of Chirata on such a scale involving more than 1000 farmers and cultivating around 70 hectare area is one of the largest cultivation effort of any Himalayan medicinal plant species. To sustain this activity lot of support is required in terms of marketing and convince the ayurvedic/pharmaceutical drug manufactures to accept material from cultivation. (Harley and Atkins, 2013) <sup>[9]</sup>.

### Chemical Constituents

- The plant contains a bitter glycoside chiratin, which on hydrolysis yields two bitter principles: ophelic acid, an amorphous bitter hygroscopic principle, and

chiratogenin, a yellow bitter glycoside, insoluble in water. (Kane, 2012).

**Table 3:** Ethnobotanical uses of swertiachirayita in traditional medicine.

Plant part used	Traditional uses	References
Whole plant	Used in several traditional and indigenous systems of medicines, such as Ayurveda, Unani, and Siddha	Mukerji, 1953, kritikar and basu, 1984, Joshi and dhawan, 2005
Roots	Serves as a drug and an effective tonic for general weakness, fever, cough, joint pain, asthma, and the common cold	kritikar and basu, 1984 and Joshi and dhawan, 2005
Whole plant	Boiled in water and one cup of decoction is taken orally to cure malaria	Shah <i>et al.</i> , 2014
Whole plant	Paste of the plant is applied to treat skin diseases such as eczema and pimples	Joshi and dhawan, 2005 and Maller <i>et al.</i> , 2015
Whole plant	Liver disorders; stomach disorders like dyspepsia and diarrhea, intestinal worms	Mukerji, 1953 and Joshi and dhawan, 2005
Whole plant	vomiting, ulcers, gastrointestinal infections, and kidney diseases	kritikar and basu, 1984
Whole plant	Used in combination with other drugs in cases of scorpion bite	Nandakami, 1976
Whole plant	Used in excessive vaginal discharge	Jadhav and bhutani, 2005

### Conclusion

*Swertia chirata* is a medicinal plant belonging to the family Gentianaceae. In India, it is also known as Chirayata. The traditional plant is used as a tonic in Unani system of medicine to cure various types of fever. Further research can be done to know the mode of action and efficacy of this plant in various type of fever. More activities have been proven scientifically and some are yet to be evaluated.

### References

- Anonymous. The Unani Pharmacopoeia Of India, CCRUM, Department of AYUSH Ministry of Health & Family Welfare, Government of India Seema Offset Press New Delhi-110006, 1992:2:117-125.
- Anonymous, The Unani Pharmacopoeia Of India, CCRUM, Department of AYUSH Ministry of Health & Family Welfare, Government of India Rakmo Press New Delhi-110020, 2007.
- Bentley R, Trimen H. (Eds.). Medicinal Plants. London: J and A Churchill, 1880.
- Chopra RN. Glossary of Indian Medicinal Plants. New Delhi: Council of Scientific and Industrial Research, 1956:237.
- Cranck J. Mathematical Diffusion. Journal of Applied Sciences, 2004;87(09):325-335.
- Das L and Raychudhuri U, Chakraborty R. Effect of baking conditons on the physical properties of herbal bread using RSM. International Journal of Food, Agriculture and Veterinary Sciences, 2012;2(2):106-114.
- Elish B, Bell W, Gell D. Stonea Dissolution in many using an essential oil ppreparation. Indian Journal of Medical Scienc, 2009;82(18):278-289.
- Fanad L, Kashif J. Total phenols and antioxidant activities of leaf and extract from *swertia chirata*, 2011;56(7):225-227.
- Harley RM, Atkins S, Budanstev A, Cantino PD. The families and genera of herbs. International Journal of Pharmaceutical Research and Development, 2013;5(06)73-80.
- Jadhav AN, Bhutani KK. Ayurveda and gynecological disorders. J. Ethnopharmacol, 2005;97:151-159. doi: 10.1016/j.jep.2004.10.020.
- Joshi P, Dhawan V. *Swertiachirayita*—an overview. Curr. Sci, 2005;89:635-640.
- Kane C, Ahmed M, Kohila M. Evaluation of drying parameters of *swertichirata* leaves. Indian Journal of Dietetics, 2009;6(77):449-470.
- Kirtikar KR, Basu BD. Indian Medicinal Plants, Vol. III. Allahabad: LM Basu Publishers, 1984.
- Kirtiker KB. Indian Medicinal Plants (2 ed., Vol. 3). Dehradun: International Book Distributors, Rajpur road, Dehradun, India, 1996:1664-6621.
- Kumar V, Van Staden J. A review of *Swertiachirayita* (Gentianaceae) as a traditional medicinal plant. Frontiers in pharmacology, 2016;6:308.
- Mukherji B. Indian Pharmaceutical Codex, Indigenous Drugs, New Delhi: CSIR, 1953:1:64-65.
- Nadkarni AK. Indian Materia Medica. Bombay: Bombay Popular Prakashan, 1989:1184-1185.
- Nandkarni KM. Indian Materia Medica, Bombay Popular Prakashan, Bombay: Elsevier, 1976:1:1184-1186.
- Natio K, Ohak E, Kondo S. Effect of menthol on the *chirata* extract. Indian Journal of Medical Science, 2004;67(05):45-59.
- Nilson J, Tabri M, Youssefi M. Comaprision of antibacterial effect on *swertiachirata*. Indian Journal of Medical Science, 2004;4(67):534-587.
- Scartezzini P, Speroni E. Review on some plants of Indian traditional medicine with antioxidant activity. J. Ethnopharmacol, 2000;71:23-42. doi: 10.1016/S0378-8741(00)00213-0.
- Shah GM, Abbasi AM, Khan N, Guo X, Khan MA, Hussain M. *et al.* Traditional uses of medicinal plants against malarial disease by the tribal communities of Lesser Himalayas–Pakistan. J. Ethnopharmacol, 2014;155:450-462. doi: 10.1016/j.jep.2014.05.047.