

**MEDICINAL VALUE AND CHEMICAL CONSTITUENT OF SWERTIA CHIRATA
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ABSTRACT

Swertia (family Gentianaceae) is a large genus of herbs distributed in the mountainous regions of tropical area at an altitude of 1200-3600 m. The herbal drug "chiretta" obtained from the dried plants of swertia species. The whole plants of Swertia are medicinal but roots are the most powerful parts (Anonymous, 1976).¹ These are useful as a tonic without aroma or astringency. In Indian medical system chiretta is used as remedy for bronchial asthma, liver disorders, chronic fever, anemia, stomachic and diarrhoea. Chiretta is also used in dyeing cotton cloth and in liquor industry as bitter ingredients. In Ayurveda, S. chirayita is used as antipyretic, anthelmintic, and antiperiodic, laxative and in asthma and leucorrhoea. In Yunani system the plant is used as astringent, tonic, stomachic, lessens inflammation, sedative to pregnant uterus and chronic fevers (Kirtikar and Basu, 1984) ². 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.

The major bioactives of Swertia are xanthenes, however, other secondary metabolites such as flavonoids, iridoid glycosides and triterpenoids are also active constituents of this genus. These secondary metabolites played significant role in biological activities such as hepatoprotective, antihepatotoxic, antimicrobial, anti-inflammatory, anticarcinogenic, antileprosy, hypoglycemic, antimalarial, antioxidant, anticholinergic, CNS depressant and mutagenicity. The major active constituents of *Asparagus racemosus* are steroidal saponins. Isoflavones, asparagine, racemosol, polysaccharides, mucilage, vitamins A, B1, B2, C, E, Mg, P, Ca, Fe, and folic acid present in roots. It is also useful in treatment of epilepsy, kidney disorders, chronic fevers, excessive heat, stomach ulcers and liver cancer, increases milk secretion in nursing mothers and regulates sexual behaviors. Keywords: Swertia chirata, glycoside chiratin, hepatoprotective, antihepatotoxic, antimicrobial, anti-inflammatory.

Keywords:

Gentianaceae, bioactives of Swertia, asparagine, racemosol,

INTRODUCTION

Natural products, especially plants and herbs, have always been a common medicament source, either as pure active principles or traditional preparations. Traditional medicine has been used in developing and developed countries for centuries, and still, 80% of the population uses plant-based medicines for their health care needs.

Since centuries, traditional medicinal plants have been used all over the world and they play an important role in preventing and treating of various diseases. Medicinal herbs have been popular in developing and developed countries due to its safety, efficacy, easily availability and lesser side effects ^{3,4}. A lot of herbal plants have been used in traditional medicine as hepatoprotective one of them is Swertia chirata.

It is an ancient herb was introduced to Europe in 1839. Sometimes it is also known as the Nepali Neem because of annual/biennial herb in the forests of Nepal. This annual herb or shrub develop in the sub-temperate region of Himalayas mostly between an altitude of 1200 to 1500 meters and grows up to the height of 1.5 meters from Bhutan to Kashmir ^{3,4,5,6}. Swertia, a genus in family Gentianaceae was first describe by Roxburgh under the name of Gentiana chyrayta in 1814 ^{3, 7}. It includes a vast group of annual and perennial herbs representing about 135 species. Common ingredients of swertia species are in a number of herbal remedies.

In India, 40 species of Swertia chirata are recorded ^{5, 3, 8}. Swertia chirata has been reported as most important medicinal properties such as anti-inflammatory, hypoglycaemic, hepatoprotective, antibacterial, wound healing ⁹, antioxidant, anti-diabetic, antipyretic as well as antitussive activities ^{10,11,12,13}. Moreover the different medicinal compounds were isolated from natural herbs effecting as anticancer, antitumor and anti AIDS etc. ¹⁴. According to WHO 80% of world population depend on medicinal plants in developing and developed countries for their basic and primary health care needs ^{11, 15}. WHO estimate that around 170 million peoples are infected

with hepatitis C solitary and 3-4 millions are newly added into the list every year. In addition, more than two billion infected by hepatitis B virus and over five million are getting infected with acute hepatitis B virus yearly 11, 16.



Fig .1.Swertia chirayita. (A) Seeds, (B) Plant in nature, (C) Root of a mature plant, (D) Dry plant material, (E) High shoot multiplication in a plant tissue culture system.

The roots of *Asparagus* are the main source of the drug shatawar, the crude drug also used for increasing the secretion of milk and improving appetite in lactating women. Ripe fruits of *Asparagus curillus* cause abortion, tuberous roots with honey are given in dysuria, diabetes, and dysentery.²⁰ The roots of *Asparagus racemosus* are bitter, sweet oleaginous, cooling, and indigestible, appetizer, and are useful in dysentery, tumors, inflammation, biliousness, leprosy, epilepsy, and night blindness.²¹ In Unani system, the roots are used as laxatives, tonic, aphrodisiac, galactagogue, and in disease of kidney and liver. Shoots contain thiophene, thiazole, aldehyde, ketone vanillin, asparagusic acid, and its methyl and ethyl esters used as flavors. Flowers and mature fruits contain quercetin, rutin (2.5% dry basis), and hyperoside, and the leaves contain diosgenin and quercetin-3-glucuronide. *A. racemosus* roots mainly contain 4 saponins, for example, shatavarin I–IV, the glycosides of sarsasapogenin. Roots of *A. racemosus* are also used against jaundice.

The bark exhibited antibacterial and antifungal activity. The powdered roots contain 2.95% protein, 5.44% saponins, 52.89% carbohydrate, 17.93% crude fiber, 4.18% inorganic matter, and 5% oil. The root of *Asparagus officinalis* is more diuretic than its shoot, and the root is recommended in dropsy and is a powerful cardiac sedative. Its roots have been used as a remedy for schistosomiasis and tuberculosis. The roots of *Asparagus filicinus* are considered as tonic, astringent, and vermifuge. In India and China, this plant is given as a powerful diuretic in cholera and rheumatism ²². Ancient Grecians and Romans used *Asparagus* for its diuretic properties. It helps flush out the kidneys and help in the prevention of the formation of kidney stones. Chinese pharmacists save the best *Asparagus* roots for their families and friends, believing that it will increase feelings of compassion and love. In India, it is used to promote fertility, reduce menstrual cramping, and increase milk production in nursing mothers. *Asparagus* acts to increase cellular activity in the kidneys and thus increases the rate of urine production.

CHEMICAL CONSTITUENTS

Several isolated chemical constituents viz, coumarins, flavonoids, phytosterol, phenols, tenins, alkaloids, triterpenes, anthraquinons and biological activities of *Toona* species were documented by Negi et al. (2011).¹⁹

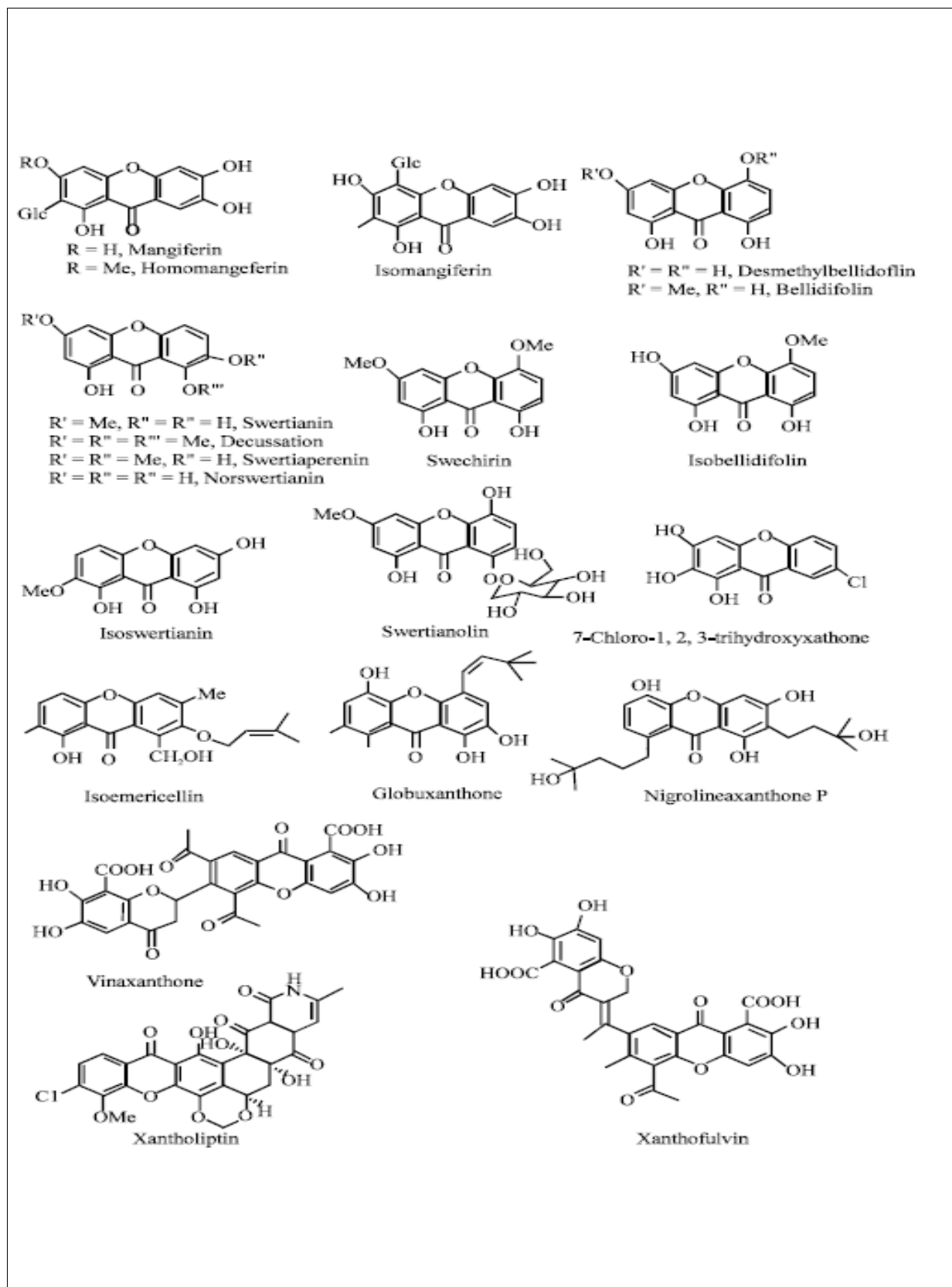


Fig.2.	Structures of some isolated xanthenes from Swertia
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Relation between important isolated chemical compounds of Swertia chirata and its biological activity

Medicinal Usage -

Coined as the “Queen Of Herbs”, Shatavari has been used for centuries as a hormone balancer and a general tonic to uplift female health and libido. Being a powerful adaptogenic herb, it not only relieves one from physical and emotional stress but also manages diabetes mellitus, prevents high cholesterol and triglyceride levels, and helps in the treatment of bacterial and fungal infections, oedema, infertility, depression and cancer.

It enhances breast development and increases breast milk production by regulating hormonal balance. Shatavari is also beneficial for men as it improves testosterone levels. It might be good for diabetics as it helps manage blood sugar levels. Shatavari might also promote memory functions due to its antioxidant activity.

According to Ayurveda, Shatavari boosts immunity due to its Rasayana (rejuvenating) property and helps in weight gain due to its Balya property. Shatavari powder can be taken along with milk or honey twice a day to get relief from the symptoms of premenstrual syndrome. Applying Shatavari powder paste along with milk or honey on the skin helps to get rid of wrinkles. It can also help promote wound healing when applied along with coconut oil. People with weak digestion are advised to avoid taking Shatavari as it is Guru (heavy) in nature and might take time to get digested 23-28 .

1. Anti-wrinkle

Shatavari helps to control wrinkles on the face. Wrinkles are due to aging, dry skin and lack of moisture. According to Ayurveda, it is due to an aggravated Vata. Shatavari helps in controlling wrinkles by balancing Vata. Shatavari also removes dead skin and gives a clear skin due to its Rasayana (rejuvenating) property.

- Take 1/2- 1 teaspoon of Shatavari powder or as per your requirement.
- Mix with honey or milk and make a paste.
- Apply it on the affected area.
- Leave it for at least 3-4 hours.
- Wash it with plain water.
- Repeat this 2-3 times a week to control wrinkles.

According to Ayurveda, Shatavari leaves helps in Vata balancing when boiled in oil and applied on the body especially on the head- Headache

2. Wound healing

Shatavari helps in quick healing of the wound, decreases swelling and brings back the normal texture of the skin. A paste of Shatavari powder with coconut oil heals the wound and reduces inflammation. This is due to its Ropan (healing) and Sita (cold) properties.

- Take 1/2- 1 teaspoon of Shatavari powder or as per your requirement.
- Mix with coconut oil and make a paste.
- Apply it on the affected area.
- Leave it for at least 3-4 hours.
- Repeat this for quick wound healing.

RECOMMENDED DOSAGE OF SHATAVARI . 30-31.

- Shatavari Juice - 1-2 teaspoon or as per your requirement.
- Shatavari Paste - ¼-½ teaspoon or as per your requirement.
- Shatavari Powder - ½-1 teaspoon or as per your requirement.

HOW TO USE SHATAVARI

1) Shatavari Fresh Paste with Rose water

- Take 4-5 Shatavari leaves.
- Grind them to form a paste.
- Add rose water to it and apply evenly to the face and neck.
- Wait for atleast 5-7 mins.
- Wash with fresh water.
- Use this remedy 2-3 times a day to rejuvenate the skin and to control hyperpigmentation.

- 2) Shatavari Powder with Honey
 - a) Take ½-1 teaspoon of Shatavari Powder.
 - b) Mix it with honey and apply evenly to the face and neck.
 - c) Wait for 5-7 mins.
 - d) Wash with fresh water.
 - e) Use this remedy 2-3 times a day for a clear youthful skin.

Pharmacological Actions of Shatavari Kalpa

Anti-inflammatory: Reduces pain and inflammation during menstrual flow and also after a sudden abortion.

Antioxidant: Neutralize the free radical damage on the skin due to harmful sun rays.

Carminative: Prevents the formation of gas thereby treats flatulence and abdominal distension.

Estrogenic: The presence of estrogenic compound or phytoestrogen in Shatavari effectively balances estrogen levels, stops bleeding, and supports the restoration of the endometrium.

Galactagogue: This action promotes lactation in women when taken in prescribed doses.

Dosage: 1-2 teaspoon preferably with warm milk, twice a day, once in the morning and in the evening or as directed by the ayurvedic practitioner or doctor.

Shatavari for Hormone Regulation

Shatavari is known for its influence on the adrenal glands. Imbibed with phytoestrogenic bio-active components, Shatavari is crucial in keeping the hormonal balance, battling menstrual cramps, and providing relief from mood swings, depression, insomnia, hot flashes, sweating etc. during the menstrual cycle. A prescribed amount of root powder not only helps women beat PMS symptoms but also facilitates hormone regularisation in women trying to conceive.

Other Benefits of Shatavari:

1. **Promotes Cardiac Functioning:**

Shatavari is one such ayurvedic herb that has been found to have a positive effect on the heart. Being a natural antioxidant and a cardio-protective herb, it plays a crucial role in treating a host of heart ailments. It relaxes the cardiac system, by soothing the mind, which is extremely advantageous for patients suffering from arrhythmias and palpitations. It is also beneficial in strengthening the heart muscles, dropping cholesterol levels in the blood and preventing lipid accumulation, which in turn reduces the risk of atherosclerosis, heart blocks, heart attacks, blood clots, etc.
2. **Enhances Digestion:**

Shatavari is known as an excellent digestive herb. The anti-flatulent property of the root powder of this climber reduces the formation of gas in the alimentary canal, thus preventing flatulence, bloating and abdominal distension. It also reduces indigestion, increases appetite, and promotes better absorption of nutrients in the body. The abundance of fibre in the root powder makes this a potent remedy for constipation and other digestive issues. Mix 1 tbsp of the root powder in warm water and add a pinch of honey to it. Drink it once regularly to treat indigestion.
3. **Treats Wounds And Ulcers:**

The powerful anti-inflammatory and anti-ulcer properties of shatavari roots play a key role in treating different types of ulcers like peptic ulcer, ulcerative colitis, canker sores, or mouth ulcers, etc. The bioactive composites in the plant encourage tissue regeneration and the juice extracted from the leaves is also used for dressing wounds.
4. **Manages Diabetes:**

The excellent hypoglycaemic property of shatavari plays a significant role in alleviating the blood sugar level of the body. The production of insulin from the pancreatic β -cells becomes active on taking shatavari root powder. It helps to reduce the breakdown of starch into glucose which in turn leads to low blood glucose levels.

5. Prevents Anxiety and Depression:

Being a potent mood enhancer, Shatavari is beneficial for treating different types of psychotic problems like depression, dementia, etc. It stabilises the Vata and Pitta doshas in the body which in turn keeps the serotonin level under control and helps to reduce various symptoms of anxiety which includes uneasiness, restlessness, cold hands, and feet, etc. The potent antidepressant properties of the herb also help in calming the mind, reducing irritability and improving energy and stamina.



Fig. 3 .Dr Shailendra BAMS, Ayurveda Practioner. 29

Benefits Of Shatavari For Hair

Shatavari plants help in hair growth. There are the following ways by which it helps hair to grow.

The anti-inflammatory property of Shatavari helps to soothe the scalp. It prevents skin irritation from increasing inflammation, and it promotes the growth of hair.

Stress is one of the main causes of losing hair, and Shatavari being an Adaptogenic herb, deals with physical and emotional stress, which prevents hair loss.

Shatavari also strengthens hair. It also helps to maintain the color of hair.29

Shatavari Side Effects:

Studies have found that Shatavari is safe for most people, even for long-term use. A 2003 study also found it to be safe for pregnant and breastfeeding. But we recommend you talk to your doctor before taking Shatavari, especially if you are pregnant or breastfeeding. Those allergic to asparagus should also avoid this herb. You should also avoid Shatavari if you are on other diuretic treatments or medicines (like furosemide). Since Shatavari may lower blood sugar levels, diabetics should be cautious with this herb. There are reports of allergic reaction in some people who take shatavari. If you're allergic to asparagus, avoid this supplement. Seek medical attention if you experience worsening asthma or allergic reaction symptoms. This includes, rash, fast heart rate, itchy eyes, itchy skin, difficulty breathing, dizziness Shatavari may have a diuretic effect.

Conclusion

Since time immemorial, Shatavari, “the Queen Of Herbs” has been mentioned in several ayurvedic scriptures as an ultimate remedy owing to its enormous health benefits. This incredible medicinal herb is classified as an adaptogen and helps in normalising stress and anxiety. Being a potent aphrodisiac, it improves libido, treats various infertility issues and improves the reproductive health in both men and women. It also ensures better functioning of the heart, controls diabetes, treats eye problems, aids in digestion and thus improves overall stamina and body immunity. Shatavari powder is a natural herb that can be used by people of all genders and ages, but it

is particularly beneficial for women. It is a versatile herb that can provide a range of health benefits for women, particularly in the areas of reproductive health, lactation, and hormonal balance. Shatavari powder is also useful for those who suffer from digestive issues, inflammation, stress, and anxiety.

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