INTRODUCTION

_Swertia chirata_ is known as _Chirayata_ in India. In Hindi the herb is called Chiretta and in Sanskrit it is called _Bhunimba or Kirata titkata._ This ancient herb is also sometimes known as the Nepali Neem because it is an annual/binneal herb in the forests of Nepal. This plant was introduced to Europe in 1839 and has been used widely since. This annual herb is found in the Himalayas majorly between the heights of 1200 to 1500 meters and grows up to the height of 1.5 meters. _Chirayata_ has erect stems which grows about 2-3 ft long. Its
stems are orange brown or purplish in colour and contain large continuous yellowish pith. Its root is simple, stout, short, about 7 cm long and usually half an inch thick. The tiny flowers are green-yellow in colour. The fruits are small, one-celled capsule with a transparent yellowish pericarp. It is known to have leaves in opposite pairs which are about 10 cms in length with no stalks. The plant contains glycoside chiratin which yields on hydrolysis. The ophidic acid in the plant is brown in color and is identified as a hydroscopic substance. This is a substance that is soluble in both water and alcohol. It contains tannin, resin and ash. *S. chirata* is a beneficial bitter tasting tonic which is used as a laxative and also an appetizer. It corrects the nutrition disorders in the body and helps in bringing normality into the system. The herb is used widely to stimulate the appetite of people suffering from anorexia and other such problems. It helps in relieving acidity, nausea and biliousness. It used as a laxative, vermifuge, sedative and alternative. It has the properties to relieve cough, bronchial infections, malaria and asthma. The entire plant is used in medicines for over centuries.

**TAXONOMY OF SWERTIA CHIRATA**:

**Kingdom**: Plantae  
**Phylum**: Tracheophyta  
**Class**: Magnoliopsida  
**Order**: Gentianales  
**Family**: Gentianaceae  
**Genus**: Swertia  
**Species**: chirata  
**Binomial Name**: *Swertia chirata* Buch Ham  
**Synonyms**:

- *S. chirayita* (Roxb. Ex Flem.) Karst  
- *S. tongluensis* Burkill.  
- *Ophelia chirata* Griseb.

**Table 1**: Shows Synonyms Of Chirayata As Mentioned In Ayurvedic Texts With derivation:

<table>
<thead>
<tr>
<th>KirataTikata</th>
<th>The plant grows at Himalayan range which is bitter in taste.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Katatikta</td>
<td>It has bitter taste.</td>
</tr>
<tr>
<td>Kandatikta</td>
<td>Kanda means stem. Stem has tikta (Bitter) taste.</td>
</tr>
<tr>
<td>Kirata</td>
<td>Kirata means Himalaya region it present at an height of 1350-3350 m height.</td>
</tr>
<tr>
<td>Bhunimba</td>
<td>It is considered as small size nimba tree due to resemblance of tikta rasa.</td>
</tr>
</tbody>
</table>

**Table 2**: Shows Vernacular Names:

<table>
<thead>
<tr>
<th>Hindi</th>
<th>Chirayata</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>Chiretta</td>
</tr>
<tr>
<td>Bengali</td>
<td>Chirata</td>
</tr>
<tr>
<td>Tamil</td>
<td>Nilavembu</td>
</tr>
<tr>
<td>Punjabi</td>
<td>Charaita</td>
</tr>
<tr>
<td>Marathi</td>
<td>Kiraita</td>
</tr>
<tr>
<td>Gujarati</td>
<td>Kariyatum</td>
</tr>
<tr>
<td>Kannada</td>
<td>Nilavebu</td>
</tr>
<tr>
<td>Malayalam</td>
<td>Nilavippa</td>
</tr>
</tbody>
</table>

**HABITAT**:

**INDIA**: Jammu & Kashmir, Himachal Pradesh, Uttarakhand, Arunachal Pradesh, Meghalaya and Sikkim between altitudinal ranges of 1400 – 3270 m.  
**CHINA; TIBET; NEPAL and BHUTAN.**

It occurs sporadically in subtropical and temperate forests, in open forest margins, cool and moist places or in shady moist slopes among tall grasses. The major threats to the wild pop-
ulation of this plant species are loss of habitat and harvesting of the plant for medicinal uses.

DIFFERENT VARIETIES:
Kiratatikta and Kalamegha are two varieties viz., S. chirata and A. paniculata. Narhari Pandit quoted two varieties viz., Kiratatikta and Naipalanimba. The second variety also appears as a Himalayan species.

SUBSTITUTE:
In the absence of a desired first choice medicinal herb, classical Ayurveda recommends use of a functionally similar substitute. Here we report substitutions of S. chirata-
1. Swertia purpurascens Wall.
2. S. decussata Nimmo
3. S. chinensis Franchet
4. S. paniculata Wall
5. S. perennis Linn.
6. S. lawii Burkill
7. S. affinis C. B. Clarke
8. Exacum bicolor Roxb.
10. Erythraea roxburghii G. Don
11. Enicostemma littorale Blume
All belongs to Gentianaceae family.

Table 3: CLASSIFICATION IN AYURVEDA:

<table>
<thead>
<tr>
<th>Charak Samhita</th>
<th>Stanyashodhan mahakashaye⁸, Trsanigrahana mahakashay e⁹ and in tikta skandha¹⁰.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Susurut Samhita</td>
<td>Aragvadham gana²¹</td>
</tr>
<tr>
<td>Acharya Vagbhat</td>
<td>Aragvadham gana²²</td>
</tr>
<tr>
<td>Nighantu Adarsh</td>
<td>Kiratadi Varga¹³</td>
</tr>
<tr>
<td>ShodhalNighantu</td>
<td>Guduchyadi varga²⁴</td>
</tr>
<tr>
<td>KaidevNighantu</td>
<td>Aoushdhi varga²⁵</td>
</tr>
<tr>
<td>MadanpalNighantu</td>
<td>Abhyadi Varga²⁶</td>
</tr>
<tr>
<td>Abhidhaanratnamala</td>
<td>Tiktravyasakandha²⁷</td>
</tr>
<tr>
<td>BhavprakashNigantin</td>
<td>Haritkayadi Varga¹</td>
</tr>
<tr>
<td>MahaushadhiNighantu</td>
<td>Mahaushadhi varga²⁸</td>
</tr>
<tr>
<td>Priyanighantu</td>
<td>Satpushpadi Varga²⁹</td>
</tr>
</tbody>
</table>

PHYSOTCHEMISTRY & BIOLOGICAL ACTIVITY:
Table 4: Shows important bioactive compounds isolated from Swertia chirata and their Biological activities.²⁰

<table>
<thead>
<tr>
<th>S.NO.</th>
<th>PHYTOCHEMICALS</th>
<th>BIOLOGICAL ACTIVITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Amarogentin</td>
<td>Antileishmanial, Topoisomerase inhibitor, Anticancer, Anti-diabetic, Gastroprotective</td>
</tr>
</tbody>
</table>
5. Sweroside  
   Antibacterial, Hepatoprotective, Hyperpigmentation, Osteoporosis

6. Amaroswerin  
   Gastroprotective

7. Gentianine  
   Antipsychotic, Antimalarial

8. Oleanolic acid  
   Antimicrobial, Antitumor, Antiinflammatory, antioxidant

9. Ursolic acid  
   Antimicrobial, Antitumor

10. Swertanone  
    Antiinflammatory

11. Syringaresinol  
    Hepatoprotective

12. Bellidifolin  
    Hypoglycemic

13. Isobellidifolin  
    Hypoglycemic

14. 1-Hydroxy-3,5,8-trimethoxyxanthone  
    Antimalarial

15. 1-Hydroxy-3,7,8-trimethoxyxanthone  
    Spasmogenic agent, Antiulcerogenic

16. 1,5,8-trihydroxy-3-methoxyxanthone  
    Blood sugar lowering

17. β-Amyrin  
    Anti-inflammatory, Antimicrobial, antifungal.

18. Chiratol  
    Anti-inflammatory

Table 5: shows Isolated Compounds from some substitutes of *Swertia chirata*.

<table>
<thead>
<tr>
<th>S.NO.</th>
<th>SUBSTITUTE</th>
<th>PHYTOCHEMISTRY</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>S. paniculata</td>
<td>β – sitosterol, ursolic acid, bellidifolin, luteolin</td>
</tr>
<tr>
<td>2.</td>
<td>S. perennis</td>
<td>1,8-Dihydroxy-3,7-Dimethoxyxanthone.</td>
</tr>
<tr>
<td>3.</td>
<td>S. decussata</td>
<td>Swertianin, 1,7,8-Trihydroxy-3-Methoxyxanthones.</td>
</tr>
</tbody>
</table>

IMPORTANT PHARMACOLOGICAL EFFECTS:

*S. chirata* is used as antipyretic, anthelminitic, antiperiodic, cathartic and in asthma and leucorrhoea in Ayurveda and as harsh, analeptic, stomachic, mitigate inflammation, relaxing to pregnant uterus and never ending fevers. It is a remedy for ulcers, Gastrointestinal diseases, skin diseases, cough, hiccup, liver and Kidney diseases, Neurological disorders and urinogenital tract disorders. Also used as purifier of Breast milk, and as a laxative and carminative.

Table 6: Shows Evaluation of the Pharmacological effects of *Swertia chirata*.

<table>
<thead>
<tr>
<th>Pharmacological effects evaluated</th>
<th>Plant part (s) tested</th>
<th>Test system</th>
<th>Extracting solvent</th>
<th>Test Organism/Models</th>
<th>Control</th>
<th>Toxicity test</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antibacterial</td>
<td>Whole plant</td>
<td><em>In vitro</em></td>
<td>EtOH</td>
<td><em>Escherichia coli</em> ATCC 26922, <em>Klebsiella pneumonia</em> ATCC 15380, <em>Pseudomonas aeruginosa</em> ATCC 25619</td>
<td>Ciprofloxacin</td>
<td>None</td>
</tr>
<tr>
<td>Antibacterial</td>
<td>Whole plant</td>
<td><em>In vitro</em></td>
<td>DCM; EtOH</td>
<td><em>Staphylococcus aureus</em></td>
<td>Kanamycin 30 g/disc</td>
<td>None</td>
</tr>
<tr>
<td>Antibacterial</td>
<td>Stem</td>
<td><em>In vitro</em></td>
<td>EtOH</td>
<td><em>Staphylococcus aureus</em></td>
<td>Chloramphenicol 30 g/disc</td>
<td>Brine shrimp assay–positive</td>
</tr>
</tbody>
</table>
Antifungal | Whole plant | In vitro | MeOH | Aspegillus niger MTCC 1881 | Amphotericin | None
---|---|---|---|---|---|---
Antileishmanial | Whole plant | In vitro | MeOH | Leishmania donovani AG83 | – | Cytotoxicity testnegative
Antihelmintic | Whole plant | In vitro | Water; MeOH | Haemonchus contortus | Levamisole 0.55 mg/ml | None
Antimalarial | Leaves/Stem | In vitro | MeOH; PE; Water; EtOH | Plasmodium falciparum FCK 2 | Parasitized red blood cells and 10 Ci of [35S]-methionine | None
Anti-hepatitis B virus | Whole plant | In vitro | 50% EtOH | HepG 2.2.15 cells line | Tenofovir | None
Antiinflammatory | Aerial parts | In vivo | Petroleum | N/A | Mice treated with vehicle or Diclofenac (10 mg/kg) | None
Hypoglycemic | Whole plant | In vivo | 95% EtOH | N/A | Mice treated with vehicle | None
Antidiabetic | Whole plant | In vitro | 95% EtOH; HEX | STZ-NAD(streptozotocin-nicotinamide) induced diabetic albino mice | Metformin (100 g/kg) | None
Antipyretic | Root | In vitro | Water | Brewer’s yeast induced pyrexia Typhoid-Paratyphoid A, B vaccine induced Hyperexia | Paracetamol (150 mg kg⁻¹) | None

**DISCUSSION**

*Swertia chirata* or sometimes called *Chitretta* is a bitter herb from India that has many health benefits. In Ayurvedic Medicine *S. chirata* is called a tridosha balancing. It’s bitter, hot, pungent, and dry thus making it good for most conditions. It is used by tribals to treat different type of fevers. It is used in the form of juice for its antipyretic activities. It is considered Vulnerable based on International Union For Conservation of Nature (IUCN) CAMP Criteria. This article gives summarize explanation on Phytochemicals of *S. chirata* and their biological activity along with phytochemistry of some substitutes which shows the functionally similar herbs have some same phytochemicals. This article is a compilation of Taxonomy, Classical review, Botany, Distribution, Habitat, Varieties, Substitutes, Phytochemistry, Biological activity and pharmacological effects of *S. chirata*. *S.chirata* is used to cure many diseases as mentioned in Ayurveda have been scientifically proved by its phytochemistry & biological activity. This review article is an attempt to promote people to conserve this important medicinal herb which is extensively useful as an antipyretic herb.

**CONCLUSION**

*Swertia chirata* Buch Ham is a medicinal plant indigenous to temperate Himalaya. It is known as Chirayata in India, Kirata tikata in Ayurve-
The plant is used as a bitter tonic in Ayurvedic Herbal system to cure various types of fever. Further research can be done to know the efficacy and mode of action of this plant in various viral fevers, Dengue, Chikungunya etc.

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Review On Swertia Chirata Buch.-Ham. Ex Wall: A Bitter Herb W.S.R To Its Phytochemistry And Biological Activity

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