**Epimedium sagittatum Sieb. et Zucc.**

**Scientific name:** Epimedium sagittatum Sieb. et Zucc.  
**Family:** Berberidaceae  
**Genus:** Epimedium  
**Species:** sagittatum  
**Synonyms:** Aceranthus sagittatus Siebold. & Zucc, Epimedium sinense Siebold. ex Hance.  
**Common name:** Barrenwort, Bishop's Hat, Fairy Wings, Horny Goatweed  
**Part of plant:** Leaves  
**Plant Description:** The perennial plant grows to about 0.5 m by 0.4 m. The leaf is in the shape of an arrowhead, thus the word "sagittatum," which means arrowhead shaped. It is in flower from May to June. The flowers are hermaphrodite (have both male and female organs). The plant can grow in semi-shade (light woodland). It requires dry or moist soil. Horny Goat Weed is a low growing, deciduous perennial with leathery leaves (up to 1 foot long) spreading by underground stems. The flowers of this plant are 1 to 2 inches wide, resemble a bishop's hat (pendent-shaped), have long spurs, and come in various colors (purple, pink, yellow or white).  
**Chemical constituents:** Epimedin A, epimedin B, epimedin C and baohuoside, icariin, along with prenylatedflavonol glycosides sagittasine A-C, acylatedflavonol glycosides such as kaempferol, together with flavonolignans, 2-phenoxychromones, a lignan, and aromatic acid derivatives.

**Structures of isolated chemical constituents of E. sagittatum**

![Icariin](image1.png)  
![Epimedin A](image2.png)
Mechanism of Action:
E. sagittatum can inhibit an enzyme called acetylcholinesterase (AChE). AChE rapidly stops neurotransmission at cholinergic synapses like those found in the brain and at neuromuscular junctions, which are needed for speedy responses in the neuromuscular system.

Action of herb: Anti-rheumatic, aphrodisiac, carminative, expectorant, ophthalmic, tonic and vasodilator, anti-proliferative, anti-tumor, anti-inflammatory,

Uses: Used as a kidney tonic, it also treats sterility and barrenness. It is taken internally in the treatment of asthma, bronchitis, cold or numb extremities, arthritis, lumbago, impotence, involuntary and premature ejaculation, high blood pressure, erectile dysfunction, female sexual dysfunction and absentmindedness. It should be used with some caution since in excess it can cause vomiting, dizziness, thirst and nosebleeds. The plant is harvested in the growing season and dried for later use.

Side effects & toxicity: Dizziness, dry mouth, thirst or vomiting when taking E. sagittatum. Very high doses might cause dilated pupils, muscle spasms and cramps, rapid heartbeat, palpitations, hyperactivity and respiratory depression. An allergic reaction to E. sagittatum is possible, with signs of a rash, hives, itching, wheezing, difficulty breathing, and facial, mouth or throat swelling.

Contraindications: Young children, pregnancy and lactation. Contra-indicated in patients with hormone related cancers, low blood pressure, cardiovascular conditions; liver or kidney diseases.

Dosages: A typical dose of horny goat weed is 250-1,000 mg daily.
Drug interactions: It is possible that Epimedium could interact with prescription stimulant drugs, anti-depressants Zoloft, Paxil, Prozac, heart medications, blood pressure medications, and erectile dysfunction medicines such as Viagra, Cialis, and Levitra. Caution is advised when mixing herbal remedies with prescription medications.

Horny goat weed seems to decrease blood pressure. Taking horny goat weed along with medications for high blood pressure might cause your blood pressure to go too low. Some medications for high blood pressure include captopril (Capoten), enalapril (Vasotec), losartan (Cozaar), valsartan (Diovan), diltiazem (Cardizem), Amlodipine (Norvasc), hydrochlorothiazide (HydroDiuril), furosemide (Lasix), and many others.

Horny goat weed might slow blood clotting. Taking horny goat weed along with medications that also slow clotting might increase the chances of bruising and bleeding. Some medications that slow blood clotting include aspirin, clopidogrel (Plavix), diclofenac (Voltaren, Cataflam, others), ibuprofen (Advil, Motrin, others), naproxen (Anaprox, Naprosyn, others), dalteparin (Fragmin), enoxaparin (Lovenox), heparin, warfarin (Coumadin), and others.

High Performance Liquid Chromatography of *E. sagittatum*

In HPLC study carried out by following peaks were observed in the chromatogram: Kaempferol-3-O-rhamnoside, hexandraside F, epimedin A, epimedin B, epimedin C, icariin, epimediode C, baohuoside II, caohuoside C, baohuoside VII, sagittatoside A, sagittatoside B, 2”-O-rhamnosyl icariside II, baohuoside I.

![HPLC Chromatogram of *E. sagittatum*](image)

DNA Sequence Assembly and Composition of *E. sagittatum*

DNA sequencing was carried out by Liu et al. (2013). See the table below.

<table>
<thead>
<tr>
<th>Nuclear DNA insert</th>
<th>Number of assemblies</th>
<th>Calculated sequence length (bp)</th>
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<tbody>
<tr>
<td>Confirmed annotated gene sequences</td>
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<tr>
<td>Putative gene sequences</td>
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<td>Unknown elements</td>
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<tr>
<td>Total ENS dataset</td>
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<td>690,804</td>
</tr>
</tbody>
</table>

*ENS, *E. sagittatum* Nuclear Sequences.

Analysis of chromosomal number of *E. sagittatum*

*E. sagittatum* cells chromosome counts of metaphase revealed a chromosome number of $2n = 2x = 12$.

![Root-tip mitotic metaphase chromosomes of *E. sagittatum* 2n = 2x = 12 are shown. Scale bar = 5µm.](image)


Anti-osteoporosis activity of *E. sagittatum*

Nian et al. (2006) research work revealed that ovariectomy rats developed bone changes similar to those observed in estrogen deficient osteoporotic women most evidently a decrease in bone density. *E. sagittatum* was found to be effective in preventing bone loss and estrogen deficiency for treatment of osteoporosis.

Neuro-protective effect of *E. sagittatum*

Neuro-protective effects of icaritin, an active constituent of *E. sagittatum* was studied by Wand et al. (2007) against beta amyloid-induced neurotoxicity in primary cultured rat neuronal cells via estrogen-dependent pathway.

Effects of *E. sagittatum* on male sex characteristics

Makarova et al. (2007) studied the effect of hydroalcoholic extract of *E. sagittatum* which is believed to produce aphrodisiac effects and is commonly used in Chinese herbal medicine to enhance erectile function.

References:


Zhang G, Qin L, Shi Y. Epimedium-derived phytoestrogen flavonoids exert beneficial effect on preventing bone loss in late postmenopausal women: a 24-month randomized, double-blind and placebo-controlled trial. J Bone Miner Res .2007 Apr 9 [Epub ahead of print].