

# Horse Chestnut



Photo © Steven Foster  
*Aesculus hippocastanum* L.

Text by Armando González Stuart, Ph.D., 2005

**Botanical family:** Hippocastanaceae.

**Other common names:** Aesculus, buckeye.

**Common names in Spanish:** Castaño de Indias.

**Medicinal parts:** The standardized extract obtained from the seeds. The bark and leaves are also sometimes used in traditional medicine (Boon and Smith, 2004; Gruenwald, 2004).

## History

Horse chestnut is a tall tree native to the Balkans, but is now found in diverse parts of Europe, as well as North America (Boon and Smith, 2004 Leung and Foster, 2003).

## Active Principles

- Aescin (a mixture of triterpenoid saponins)
- Aglycones (barringtogenol, protoaescigenin)
- Flavonoids (rutin, quercetin, among others)
- Phytosterol
- Hydroxycoumarins (aesculin, scopolin and fraxin )

- Tannins (proanthocyanidins)

(Gruenwald, 2004; Skenderi, 2004).

### **Applications in Herbal Therapy**

- The German Commission E has approved the use of horse chestnut preparations for the treatment of chronic venous insufficiency (Blumenthal, 2000, 1998).
- Horse chestnut seed extract (HCSE) is widely used in Europe and is becoming increasingly popular in North America as well, for the management of chronic venous insufficiency (CVI). Although traditionally recommended for a variety of medical conditions, CVI is the only indication for which there is strong supportive scientific evidence (Schulz et al., 2004; Wichtl, 2004; Dattner, 2003; Tiffany et al., 2002; Greeske and Pohlmann, 1996).
- A potential treatment to complement compression therapy for venous leg ulceration (VLU) could be the extract from the Horse chestnut seed, although further clinical evidence is needed before it can be amply recommended (Leach, 2004).
- In the case of concomitant chronic venous insufficiency (CVI), edema protective phytopharmaceutical preparations such as horse chestnut seed extract and flavonoids, for example, may support conventional therapy (Raake and Binder, 2002).
- Gels, ointments and lotions containing aescin can be applied topically for the treatment of varicose veins and hemorrhoids (Boon and Smith, 2004; Gruenwald, 2004).
- In traditional medicine, horse chestnut leaves have been used as a tea to relieve coughs, as well as to treat rheumatism and arthritis, although these uses have not been proven and are therefore not recommended due to their potential toxicity (Gruenwald, 2004).

### **Clinical Studies Employing Horse Chestnut**

- Various clinical trials have been conducted (most of them in Europe) to test horse chestnut preparations' efficacy for the treatment of CVI (Barrett, 2004).
- Aescin, the major active principle from horse chestnut, has shown satisfactory evidence for significant clinical activity in the treatment of chronic venous

insufficiency (CVI), hemorrhoids and post-operative edema. The active principles in this plant, mainly aescin, have anti-edematous, anti-inflammatory and venotonic properties, mainly related to the molecular mechanism of this phytochemical, which is allowing improved entry of ions into channels. This effect raises venous tension in research done both in vitro, as well as in vivo. Other mechanisms of action, such as the release of PGF-2 from veins, antagonism to 5-HT and histamine, reduced catabolism of tissue mucopolysaccharides, also emphasize the diverse mechanisms by which aescin exerts its therapeutic activity (Sirtori, 2001).

- Evidence from some clinical trials shows that HCSE is a safe and efficient short-term treatment for CVI, although more research is needed to fully assess its therapeutic potential (Pittler and Ernst, 2004; Hagen et al., 2003; Ernst et al., 2002).
- Based on meta-analyses of controlled clinical trials, HCSE seems to be an effective and safe treatment for CVI, although further controlled clinical trials are necessary in order to evaluate the long-term effectiveness and safety of this phytochemical (Siebert et al., 2002).
- In extracts of herbal drug extracts such as HCSE, the relative concentration of the main active ingredients, such as the individual saponin fractions, for example, can vary considerably from batch to batch (Loew et al., 2000).
- HCSE seems to be effective mainly in early stages of CVI, but there is currently not enough evidence it can be effective in more advanced cases (Brunner et al., 2001).
- An ethanol extract of the seeds of *Aesculus chinensis*, a closely related Chinese species, has been found to possess antiviral activity against respiratory syncytial virus (RSV), parainfluenza virus type 3 (PIV 3), and influenza virus type A (Flu A) (Wei et al., 2004).

**Table 1. Selected Clinical Trials Employing Horse Chestnut\***

Reference	Plant / Plant product	Purpose of study	Number of subjects	Results
Belcaro et al., 2004	Aescin plus essential phospholipids (AEPL) topical gel	To evaluate the efficacy of aescin and essential phospholipids (AEPL) gel on microcirculation in	Not available	Treatment with topical applications of AEPL in areas of venous microangiopathy was beneficial, may prevent ulceration, and improved

		patients with chronic venous hypertension (CVH), and venous microangiopathy		the skin healing processes.
Dickson et al., 2004	One 50 mg horse chestnut tablet (Aesculaforce®), twice daily	To evaluate the safety and tolerability of horse chestnut for the treatment of chronic venous insufficiency (CVI)	Not available	Horse chestnut tablets were a well-tolerated, safe, and efficacious treatment for Widmer stage I and II CVI.
Li et al., 2004	Escin (aescin) 300 mg. two times per day	To observe the clinical effect of escin on patients with cutaneous pruritus caused by “blood stasis” and “wind-dryness”, according to Traditional Chinese Medicine (TCM)	51	Escin had a satisfactory effect in treating pruritus caused by blood stasis and wind-dryness according to TCM theory
Ruffini et al., 2004	Aescin and essential phospholipids (AEPL) in gel form	To evaluate the effects of aescin and essential phospholipids (AEPL) in gel form on skin perfusion in CVI and severe venous hypertension	Not available	Topical treatment of venous micro-angiopathy with AEPL was very effective in improving skin perfusion and nutrition. It may also have applications in preventing venous ulcerations
Bassler et al., 2003	Beta-aescin (the main active constituent of horse chestnut seed extract)	To evaluate the bioavailability of beta-aescin from horse chestnut seed extract by means of comparative clinical studies of two formulations	36 (18 per each of the two studies)	Both studies showed no significant difference between absorption rates for the retarded versus non-retarded preparation and were equally well tolerated
Koch, 2002	Horse chestnut seed extract (Venostasin® ;600 mg per day) or Pycnogenol (360 mg per day)	To compare the efficacy of Venostasin® (horse chestnut seed extract) and Pycnogenol (French maritime pine bark extract) in the	40	Pycnogenol was more efficient than Venostasin® for the treatment of CVI

		treatment of chronic venous insufficiency (CVI)		
Wetzel et al., 2002	Gel containing a combination of aescin/diethylammonium salicylate/heparin for topical application	To investigate the clinical efficacy and safety of aescin-containing gels in the topical treatment of blunt impact injuries.	158	Preparations (gels) containing a combination of aescin/diethylammonium salicylate/heparin were safe and effective for the treatment of blunt impact injuries.
Ottillinger and Greeske, 2001	Horse chestnut seed extract (Venostasin <sup>®</sup> ) standardized to 50 mg aescin, twice a day	Two clinical studies compared compression therapy and oral therapy with horse-chestnut seeds extracts (HCSE) to placebo for relieving the symptoms of CVI	240	HCSE and compression were shown to be superior to placebo in early CVI (Grade I), but in advanced CVI (Grade II and IIIa), compression appeared to be superior to placebo, while HCSE was not. HCSE showed better results in Grade II than in Grade IIIa patients.
Rehn et al., 1996	One standardized aescin capsule (300 mg) two times a day compared to Beta hydroxyethyl rutosides (1000 mg) per day	To compare the effectiveness of in menopausal patients	137	Both oxyrutin and Horse chestnut seed extract reduced leg volume significantly compared to placebo

**\*Additional information about clinical trials and the products tested is available in the following publications:** Barrett, M. *Handbook of Clinically Tested Herbal Remedies* 2 Vols. New York: Haworth Herbal Press; 2004, Blumenthal, M. *ABC's Clinical Guide to Herbs*. New York: Thieme; 2003, Bratman S, Girman A. *Handbook of Herbal, Supplements and Their Therapeutic Uses*. St. Louis: Mosby; 2003, Bascom A. *Incorporating Herbal Medicine into Clinical Practice*. Philadelphia: F. A. Davis; 2002, Cassileth B, Lucarelli C. *Herb-Drug Interactions in Oncology*. London: BC Decker; 2003, Cupp M. *Toxicology and Clinical Pharmacology of Herbal Products*. Totowa, New Jersey: Humana Press; 2000 McKenna et al., *Botanical Medicines*. New York:

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### **Safety/Precautions**

- Standardized oral preparations containing horse chestnut extracts are commonly regarded as safe when used appropriately (Mills and Bone, 2005; Gruenwald, 2004; Blumenthal, 2003).
- Horse chestnut preparations have not been adequately tested during pregnancy and lactation. Avoid use during this time, unless prescribed by a health professional (Mills and Bone, 2005; Boon and Smith, 2004).
- Intravenous preparations containing aescin should be avoided in patients with preexisting kidney or liver disease (Mills and Bone, 2005).
- Ingestion of the unprocessed seed can be toxic (especially to small children) and should be avoided (Skenderi, 2004; Blumenthal, 2003; Leung and Foster, 2003; Duke et al., 2002).
- There are no scientific data to suggest that horse chestnut flower, raw seed, branch bark, or leaves are effective therapeutically. For this reason, it is recommended that these products should be avoided, as they are potentially toxic when ingested (Tiffany et al., 2002).

### **Potential Herb/Drug Interactions**

- Oral preparations containing Horse-Chestnut may reinforce warfarin action by heterogeneous mechanisms. They should thus not be used in patients on oral anticoagulant and/or antiplatelet therapy (Abebe, 2002; Argento et al., 2000; Heck et al., 2000).

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