

# Witch-Hazel SAP

Witch hazel extract 1:5 USP

**Witch-Hazel SAP** is sourced from certified organic bark of the *Hamamelis virginiana* species and is most efficacious in the treatment of hemorrhoids. Other uses include pain relief, bruising, inflammation, diarrhea, dysentery, bleeding, skin ailments, and the reduction of mucous discharges.

Many of witch hazel's therapeutic properties may be attributed to its high tannin content, which is 31 times more abundant in the bark than the leaf extract. The tannins found in witch hazel are in the form of hamamelitannin and give this plant its astringent properties that allow it to dry, tighten, and harden tissues. It may be applied topically to tighten pores and remove excess oil, and to temporarily tighten and soothe aching varicose veins or reduce inflammation in cases of phlebitis (an inflammation of a vein).

In addition to its tannin content, witch hazel also contains proanthocyanidins, resins, flavonoids, and small amounts of volatile oils. These all contribute to its astringent, sedative, anti-inflammatory properties and to its ability to stop bleeding.

**Witch-Hazel SAP** may be used internally or externally as it does not contain isopropyl alcohol.

## ACTIVE INGREDIENTS

Each 1.5 ml (38 drops) contains:

Wild-harvested witch hazel (*Hamamelis virginiana*) stem bark  
(1:5 extract) ..... 300 mg dried equivalent

**This product is non-GMO.**

**Contains no:** Gluten, soy, wheat, corn, eggs, dairy, yeast, citrus, preservatives, artificial flavour or colour, starch, or sugar.

**Witch-Hazel SAP** is available in bottles of 50 ml or 95 ml.

## DIRECTIONS FOR USE

**STIR WELL. Adults: Take 1.5 ml (38 drops) three times daily** or as directed by your healthcare practitioner. If you are taking minerals and/or vitamin B supplements, take this product a few hours before or after them.

## MECHANISMS OF ACTION

A recent study shows there may be more at work in witch hazel than has previously been known. A specially-filtered fraction of the extract, containing mostly proanthocyanidins, was found to have significant antiviral activity against *Herpes simplex virus type 1*. The same fraction was also found to have a strong antiplogistic (anti-inflammatory and fever-reducing) effect. In contrast, fractions high in hamamelitannin were found to have weaker antiviral or antiplogistic activity. The significance of this study is that it shows that compounds other than tannins may play a role in witch hazel's recognized antiplogistic effects, as well as newly recognized topical antiviral activity.

Such studies serve to improve products available to consumers by helping manufacturers refine extraction processes to enhance the best possible therapeutic results.

In a recent study, hamamelitannin and proanthocyanidins isolated from witch hazel were studied to determine their mechanisms of action with regards to their anti-inflammatory activity. It was found that some proanthocyanidin fractions inhibit the formation of platelet-activation factor (PAF), which is a chemical mediator of the inflammatory processes.

Strong antioxidant activity against superoxide (a highly reactive form of oxygen), which is released by several enzymes during the inflammatory process, may also play a role in witch hazel's anti-inflammatory effects.

Witch hazel's antioxidant and radioprotective activity have also been confirmed.

## INDICATIONS

- Applied topically, witch hazel can stop bleeding, reduce bruising and excess mucous discharges, dry oily skin, and shrink swollen tissue.
- It may be used as a throat gargle for cases of laryngitis, sore throat, and inflammation of the gums.
- Witch hazel is not recommended as a general daily beverage, but it may be consumed in the treatment of hemorrhoids, diarrhea, and in the tonification of the uterus, veins, and intestines.

## PURITY, CLEANLINESS, AND STABILITY

All ingredients listed for all **Witch-Hazel SAP** lot numbers have been tested by a third-party laboratory for identity, potency, and purity.

## REFERENCES

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*Hamamelis virginiana*, commonly known as witch hazel (WH), has long been used in traditional medicines. Extracts from the leaves and the bark are both widely employed, but bark extracts are found to have a higher concentration of therapeutic components such as flavonoids. Flavonoids are a large family of polyphenolic compounds with broad medicinal application. WH contains methyl gallates, condensed tannins known as proanthocyanidins, and oligomeric tannins. WH is therapeutically used for its astringent properties, antioxidant properties, and its ability to affect cellular signalling.

Polyphenols are the most abundant antioxidant compounds in our diet. Plant polyphenols are antioxidants that scavenge for free radicals, which are responsible for the cellular damage in many diseases. Studies comparing WH to other polyphenols, grape pomace (GS), and pine bark (PB) found WH to be the most protective of cells against oxidative stress.<sup>[1]</sup> Also noted was WH's potency in scavenging free radicals, which was positively correlated to its antiproliferative effects on certain skin-related cell lines.<sup>[1]</sup> The effects were attributed to the gallate content in each. WH contains the highest concentration of gallate, followed by GS with low gallate concentration, and PB which contains no gallate.

### ANTIPROLIFERATION AND CANCER

The antiproliferative effects seen may be attributed to the ability of WH to affect cellular signalling; however, results suggest that the level of galloylation may also be a factor. Another study comparing WH, GS, and PB found that WH extracts to be the most effective at inhibiting cellular proliferation in HT-29 and HCT human colon cancer cell lines.<sup>[2]</sup> WH was more effective at arresting the cycle in the S phase and inducing apoptosis.<sup>[2]</sup> WH fractions with a high degree of galloylation were also the most effective as scavengers of both hydroxyl and superoxide radicals and in protecting against DNA damage triggered by the hydroxyl radical system.<sup>[2]</sup> From recent studies, it has been concluded that galloylation and polymerization are important structural factors that influence its scavenger capacity and antitumoural properties.<sup>[3]</sup> Another comparative study involving WH, GS, and PB also confirms WH superior antiproliferative effects by inhibiting proliferation of tumoural SK-Mel-28 melanoma cells.<sup>[4]</sup> This study also found WH extracts protected red blood cells from free radicals, thereby mitigating hemolysis.<sup>[4]</sup>

### SKIN

WH is widely known for its therapeutic topical use for skin health and wound healing, and is commonly used in cosmetic formulas. One way in which proanthocyanidins strongly influence human skin cells is by increasing the proliferation of keratinocytes.<sup>[5]</sup> Further studies in vivo indicate proanthocyanidins showed a significant reduction of symptoms of irritation: WH extracts have been shown to be effective at reducing transepidermal water loss and erythema formation.<sup>[5]</sup> Full recovery of a rash and scab formation was noted after WH extract was applied daily for two weeks to a sodium hypochlorite irrigation leakage.<sup>[6]</sup> WH has also proven itself as a treatment for erythema and inflammation caused by UV radiation. Erythema and inflammation induced by UV radiation was effectively treated using an *Hamamelis* distillate in a phosphatidylcholine-based topical cream (0.064 mg/2.56 mg *Hamamelis* ketone/100 g).<sup>[7]</sup>

Another way WH extracts affect cell signalling is by inhibiting tumour necrosis factor- $\alpha$  (TNF). TNF is a cytokine that propagates inflammation and an acute phase reaction that can cause cellular death and DNA fragmentation. 100% inhibition of TNF-mediated cell death and DNA fragmentation was seen when treated to hamamelitannin concentrations greater than 10  $\mu$ M, and similar results are seen with other flavanols such as epigallocatechin gallate (EGCG).<sup>[8]</sup> Hamamelitannin did not show any activity regarding the TNF-induced upregulation of endothelial adhesiveness.<sup>[8]</sup> This observed anti-TNF activity proposes a theory to explain the antihemorrhagic effects of WH, and its use as a protective agent for UV radiation.<sup>[8]</sup>

### ANTIOXIDANT

WH is an extremely potent antioxidant that has a synergistic effect on other antioxidants such as  $\alpha$ -tocopherol (A-TOH). Studies investigating the ability of the polyphenolic fractions of WH, GS, and PB to repair A-TOH by reduction were carried out in a homogeneous hexane system and a phospholipid-like system (based on SDS micelles). In a homogenous hexane system, A-TOH was most efficiently reduced/regenerated by the tannins of WH (80%), whereas GS and PB were only 27–40% efficient.<sup>[9]</sup> In SDS micelles, WH was also the most effective at reducing A-TOH, followed by GS and PB respectively.<sup>[9]</sup> Optimal pH range for the reduction reaction was 5.8–7.8.<sup>[9]</sup> The ability to reduce A-TOH stresses the potential WH has on cellular membranes.

Studies comparing hamamelitannin to ascorbic acid concluded that hamamelitannin was a more potent free radical scavenger. A concentration of  $1.38 \pm 0.06 \mu$ M of hamamelitannin yielded a 50% inhibition of superoxide anion radicals ( $IC_{50}$ ), and an ascorbic acid concentration of  $23.32 \pm 2.23 \mu$ M yielded an  $IC_{50}$ .<sup>[10]</sup>

### VASCULAR TONE AND CONNECTIVE TISSUE

Hamamelitannin also has an effect on fibroblasts. Fibroblasts exposed to hamamelitannins had a survival rate of  $85.5 \pm 3.3\%$  compared to control ( $27.2 \pm 4.3\%$ ).<sup>[10]</sup> Fibroblasts play an important role in the development of extracellular matrix, collagen, and connective tissue, and are important for wound healing. This is important when considering hemorrhoids and varicose vein, which share a common pathogenesis. Both conditions involve loss of vascular integrity. The astringent properties of tannins help improve tonicity. WH has been shown to be effective at improving vascular tone, and to strengthen the connective tissue of perivascular amorphous substrate.<sup>[11]</sup> The use of WH is recommended as part of an alternative treatment (topically and/or orally) to both these conditions involving the loss of vascular integrity.<sup>[11]</sup> Flavonoids can also offer benefits in cases of chronic inflammation causing the degradation of connective tissue. Flavonoids have been implicated in sports injury, as they limit inflammation involved with tissue degradation, can improve local circulation, and promote a strong collagen matrix.<sup>[12]</sup>

### ANTIBACTERIAL AND ANTIVIRAL

WH can also be used topically for treating bacterial infections. Studies of WH extract have found it to have antibacterial activity in treating periodontopathic bacteria (both anaerobic and facultative aerobic bacteria).<sup>[13]</sup> Studies examining WH as an antiviral involved the ultrafiltration of hydroalcoholic extract of WH yielding a high concentration of proanthocyanidins.<sup>[14]</sup> This UF-concentrate exhibited significant antiviral activity against *Herpes simplex virus type 1* (HSV-1).<sup>[14]</sup>

### ANTI-INFLAMMATORY CELL SIGNALLING

The effect of WH on cell signalling is impressive, as it seems to have an impact on many enzymes. This contributes to the anti-inflammatory effects seen in WH. UF-concentrates of WH inhibited  $\alpha$ -glucosidase and human leukocyte elastase.<sup>[14]</sup>  $\alpha$ -Glucosidase plays an important role in carbohydrate metabolism, and hence plays a role in diabetes mellitus. By inhibiting  $\alpha$ -glucosidase, WH can inhibit the digestion of carbohydrates, thereby keeping blood sugar levels lower. Human leukocyte elastase is an enzyme that plays a role in degeneration and inflammation. Hamamelitannin and other galloylated proanthocyanidins of WH were also potent inhibitors of 5-lipoxygenase, which is responsible for the production of leukotrienes involved in allergic reactions.<sup>[15]</sup>

### SAFETY AND SIDE EFFECTS

There have been no reports of adverse effects. WH distillate/extract astringent properties may cause a cooling and tingling sensation.

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