Song of the Willow:
Medicine, Fiber and Talisman

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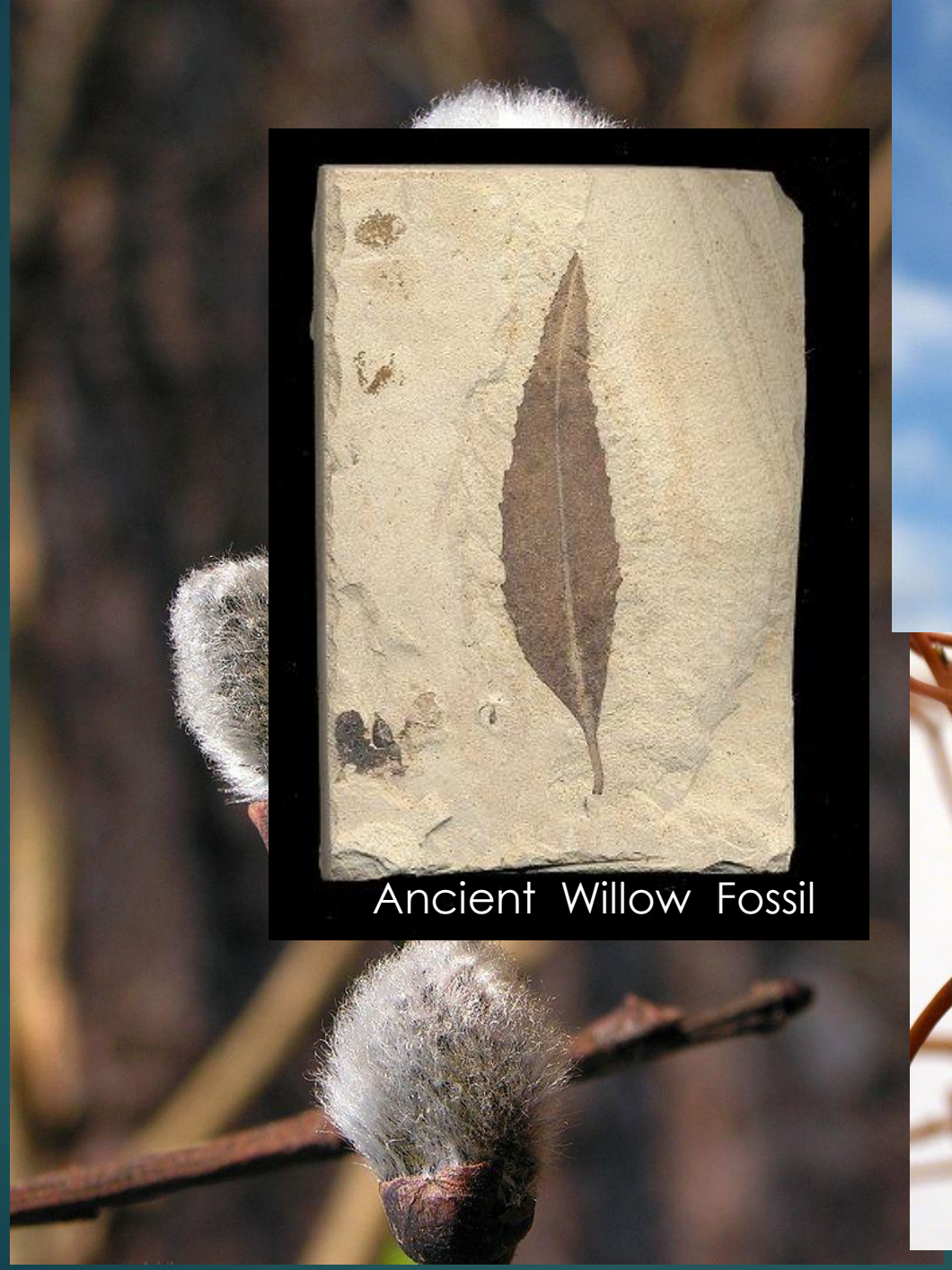
Oh wise Willow Woman , bend with me, move and support me, bring me to life.


Salix alba



Ancient Willow Fossil

Gifts from the Willow

Oh Willow Woman,
shelter me from
bitterness and
resentment.

Creating a fresh start, and new growth.
I am the essence of Strength, Flexibility
and Resilience.

Willow Woman Speaks to All Who Listen….

Willow Print from 1811 Book

Experiments and observations on the Cortex *Salicis Latifollae* or Broad leafed Willow bark by G, Wilkinson

25 experiments and clinical cases comparing Willow Bark to Cinchona bark.

Willow Bark for Cordage

- Green willow stick
- Boiled and peeled willow bark
- Willow fiber with bark removed
- Willow Cordage.

Willow Bark Tea as a Natural Dye

Willow Baskets

Living Willow Garden Structures

Salix: Willow

- 400 species
- Found all over the World
- Small deciduous trees
- Unisexual
- Male and female Catkins
- Part used: Bark
- Loves water

History

- Therapeutic use dates back 2000 years
- Traditionally used as a hemostatic, antipyretic, anthelmintic and anti-inflammatory
- 1828: Salicin identified

Ebers Papyrus 1534 BC

- Although authorless, the Ebers Papyrus is 110 pages; it dates back to 1534 BC.
- It covers 700 medicinal and herbal remedies, but the most important plant species mentioned is *tjeret* or *salix*, known today as willow.
- The Ebers Papyrus describes the use of this ubiquitous tree, as either a general purpose tonic or an anti-inflammatory/pain reliever for nonspecific aches and pains.
- By 216 AD, through trade, military contacts, and neighboring coastal city communications, willow had become a commonly used remedy across the civilized world.

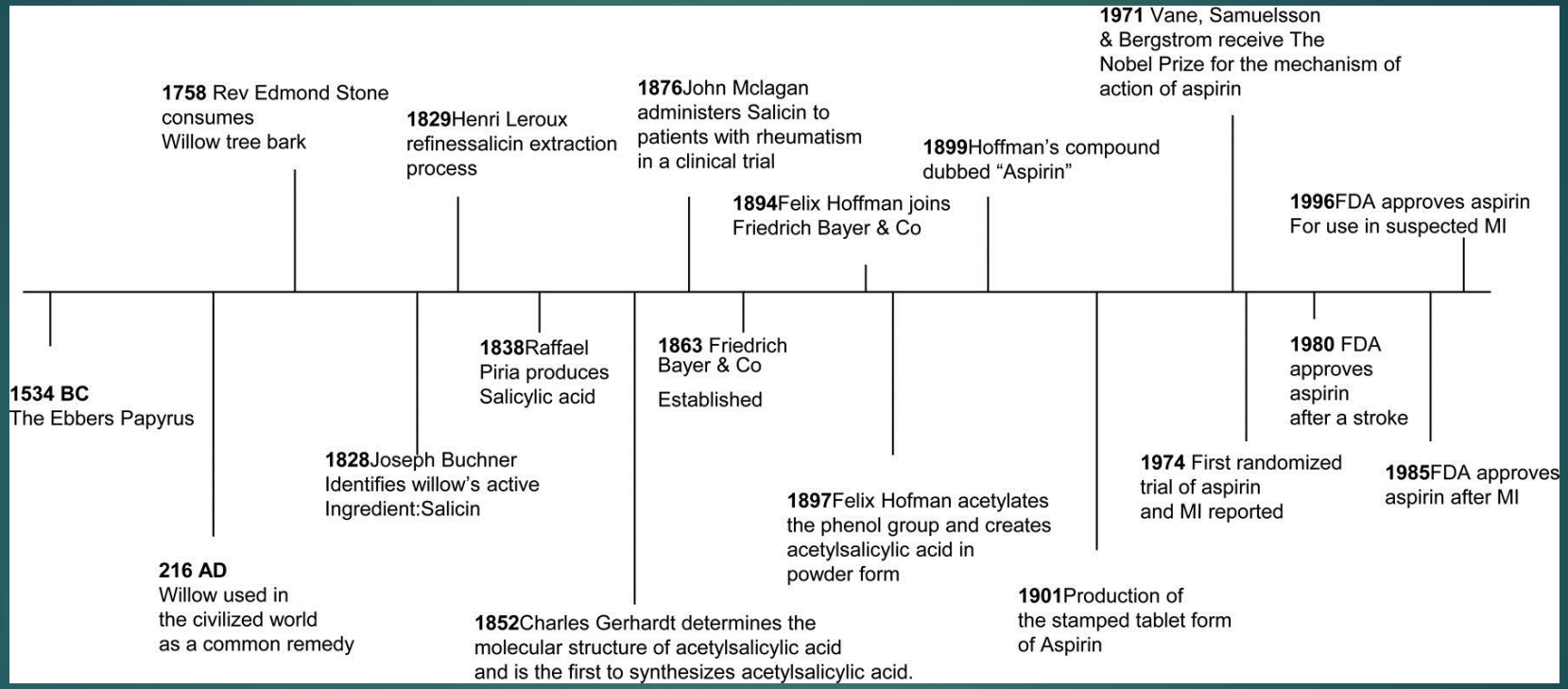
Historical Developments of Salicylates : Edward Stone

On January 20, 1862, Edwin Stone made one of the most historically important purchases of his life. Stone purchased, for £12, 2 worn papyrus scrolls in a local Luxor street market[1] that later turned out to be a formative medical textbook unlocking ancient Egypt's practice of medicine.

About Willow it said

"As this tree delights in a moist or wet soil, where agues chiefly abound, the general maxim that many natural maladies carry their cures along with them, or that their remedies lie not far from their causes, was so very apposite to this particular case that I could not help applying it; and that this might be the intention of Providence here, I must own, had some little weight with me".

The Timeline of the development of Aspirin.



Fuster V , Sweeny J M Circulation 2011;123:768-778

Eclectic Physician Use

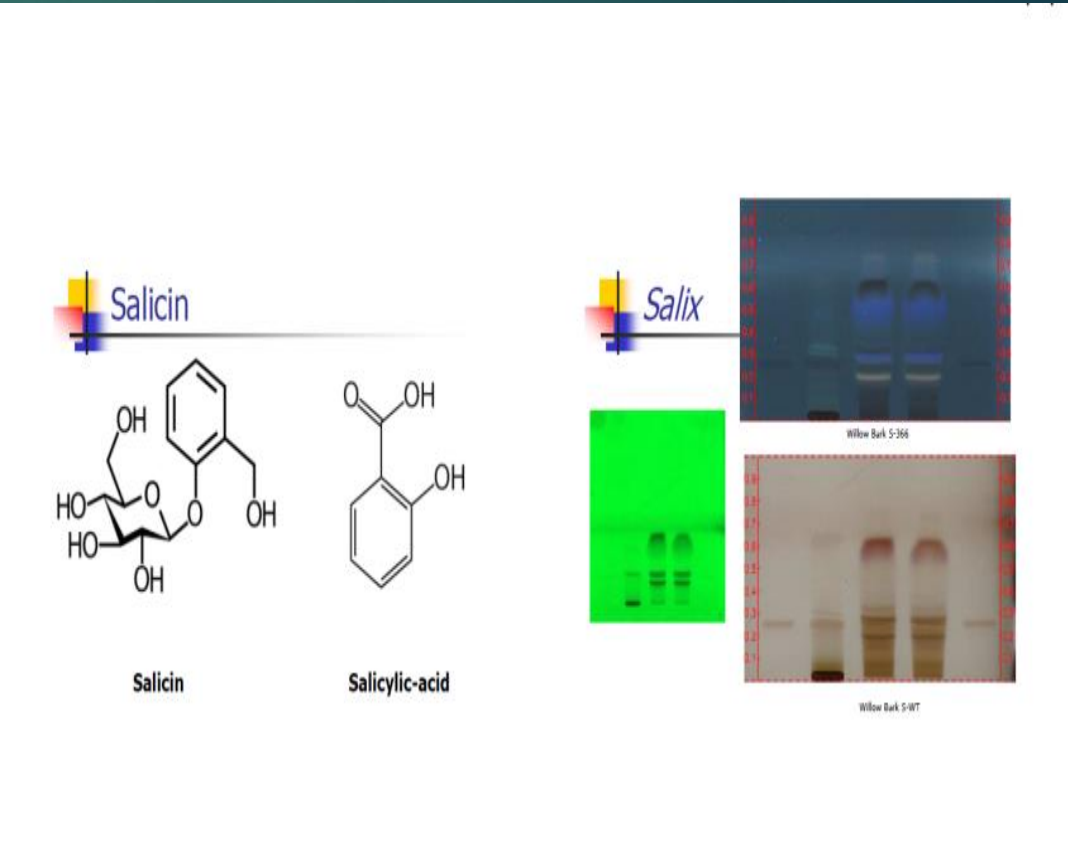
- John King recommended it as a bitter tonic and as an astringent for diarrhea and dysentery.
- Scudder 1858 recommended the astringent bark to reduce mucus secretions and dyspepsia.

Medicinal species of Salix

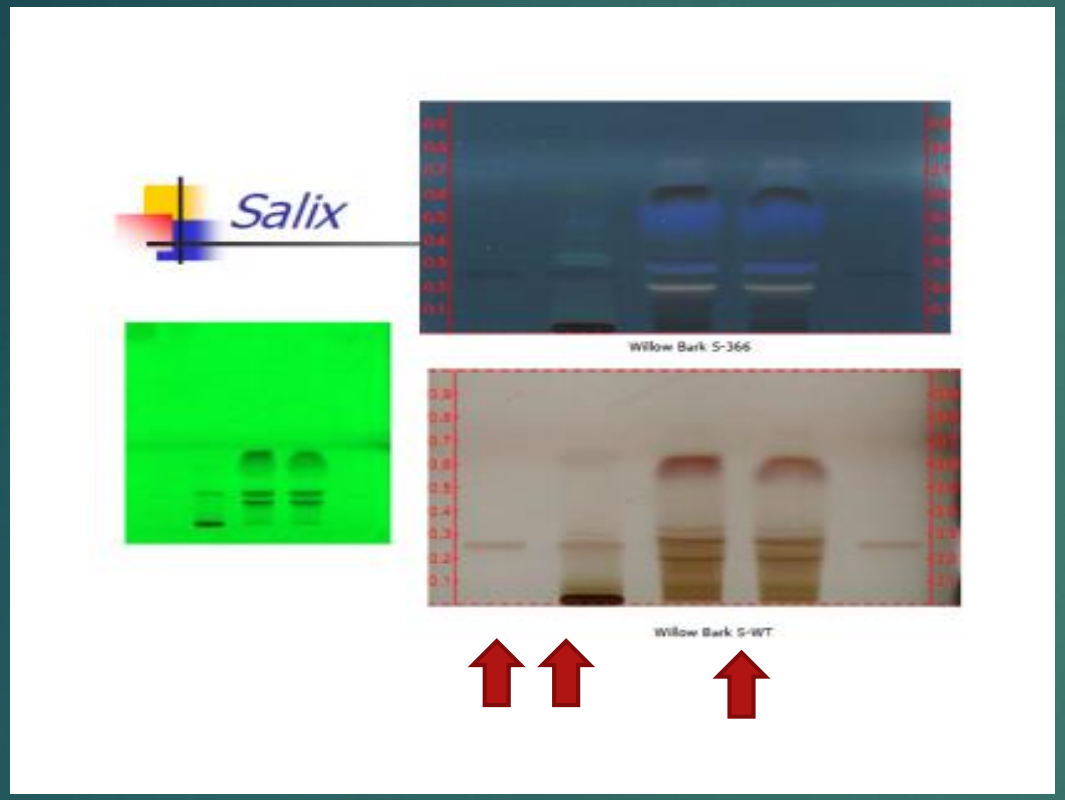
- Nearly all species used locally
- S. *alba* and S. *nigra* used commercially
- All contain derivatives of salicylic acid, mostly salicin
- Salicylic acid synthesized in 1860

Salix Constituents

- Phenolic Glycosides: Salicin, rarely more than 1% when dried
- Also Salicortin, Tremulacin, Fragilin,
- Flavonoids: Naringen, Cataechin, Epicatechin.
- Condensed Flavanones: Dimeric and Trimeric Procyanidins



Willow Bark: Chromatography



A B C

- A. Salicin Standard
- B. Willow bark Decoction
- C. Tinctures of Willow bark
- Data from Kevin Spelman, PhD

Pharmacodynamics: Salicin

- Salicin delivers salicylic acid into the bloodstream in a unique way
- Salicin is carried unchanged to the distal ileum or colon where gut flora remove the sugar and convert it to salicyl alcohol (Saligenin)
- Salicyl alcohol is absorbed and oxidized in the blood, tissue, and liver to salicylic acid.

Salicylic Acid

- Unlike Aspirin has no inhibitory effect on COX 1 or COX 2
- Salicylic acid will have little anti-platelet (blood thinning effect) because it lacks an acetyl group
- Salicylates appear to have direct analgesic effects in the CNS by unknown mechanisms

Willow Bark is more than Salicylates

- Case study of 10 persons found a dose of a high potency of willow bark (providing 240 mg of salicin resulted in blood salicylate levels of 1.4 ug/mg
- 500 mg ASA lead to levels of 35-50 ug/mg
- **Analgesic effect more than salicylates!**
- Other constituents of willow bark (e.g. flavonoids, other phenolic compounds) must contribute to the overall effect.
- In consequence, willow bark extract may offer an analgesic
- Therapy with a better tolerability (e.g. less gastrointestinal side effects) than acetylsalicylic acid or NSAIDs.*

- * Schmid B et al. *Phytother Res 2001*

Phytomedicine. 2010 Dec 1;17(14):1106-13. doi: 10.1016/j.phymed.2010.03.022. Epub 2010 May 31.

Anti-inflammatory effects of the willow bark extract STW 33-I (Proaktiv(®)) in LPS-activated human monocytes and differentiated macrophages.

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Abstract

INTRODUCTION: Willow bark extract is frequently used in the treatment of painful rheumatological diseases, such as arthritis and back pain. Its effect has been attributed to its main component salicin, but pharmacological studies have shown that the clinical efficacy of the willow bark extract cannot be explained by its salicin content alone. Therefore different modes of action have been suggested for the anti-inflammatory effect of willow bark extract. Here, we report in vitro data revelling the effect and mode of action of the aqueous willow bark extract STW 33-I as well as a water-soluble fraction (fraction E [Fr E]) in comparison with well-known non-steroidal anti-inflammatory drugs (NSAIDs) like aspirin (ASA) and diclofenac (Diclo) on pro-inflammatorily activated human monocytes and differentiated macrophages.

RESULTS: STW 33-I and the water-soluble Fr E showed concentration-dependent and significant anti-inflammatory effects in lipopolysaccharide-activated monocytes. Both inhibited the intracellular protein expression of tumour necrosis factor-alpha (TNFα) as well as the mRNA expression of TNFα and cyclooxygenase 2 (COX-2), and the release of nitric oxide (NO). In addition, apoptosis of pro-inflammatorily activated monocytes was induced. Furthermore, treatment of activated macrophages with STW 33-I inhibited the nuclear translocation of the p65 subunit of the nuclear transcription factor-kappa B (NF-κB p65).

CONCLUSIONS: The present in vitro investigations suggest a significant anti-inflammatory activity of willow bark water extract STW 33-1 and of its water-soluble fraction by inhibiting pro-inflammatory cytokines (TNFα), COX-2 and nuclear translocation of the transcription factor NF-κB in pro-inflammatorily activated monocytes. Our results provide further evidence for the therapeutic use of STW 33-I in inflammation-related disorders.

Wien Med Wochenschr. 2007;157(13-14):348-51.

Willow bark extract: the contribution of polyphenols to the overall effect.

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Abstract

The efficacy of willow bark extract in the treatment of painful mobility disorders, such as back pain and arthritis, has been attributed to the content of salicin and its derivatives as pro-drugs of salicylates. However, based on clinical experience and the evidence of experimental pharmacological studies, the fraction of total salicin cannot satisfactorily explain the clinical efficacy of willow bark. In addition, salicins and their metabolites lack the acetylating potential of ASA and must therefore possess a different mechanism of action. A detailed pharmacological screening of the aqueous willow bark extract STW 33-I addressed the question of the identification of fractions contributing to the overall effect. All in vivo and in vitro models studied pointed to relevant contributions of the fraction of polyphenols and flavonoids. The single compounds or their combinations responsible for the effect remain to be elucidated.

PMID: 17704985 [PubMed - indexed for MEDLINE]

Vioxx versus Willow Bark

- Open trial, randomized, controlled trial compared willow bark (240 mg of salicin) to Vioxx (12.5 mg)
- 114 patients with acute exacerbations of chronic low back pain
- After 4 weeks, there was no difference observed between the results of the two groups. Both had effects.

Chronic Low Back Pain

- 191 patients, double blind, placebo controlled study
- Compared 2 doses of willow bark to placebo
- After 4 weeks 39 % pain free in higher dose group, 21% in lower dose group
- 6% in placebo group

Willow Bark Analgesic

- More than an Aspirin effect
- Suggested action by lipoxygenase and hyaluronidase inhibition and free radical scavenging effects
- Full spectrum of willow bark likely necessary
- Few if any side effects, Unlike ASA

Willow Bark Potency

- Studies used 400 mg tablets of willow bark extract containing about 15% salicin
- 2 to 4 tablets contain 120 to 240 mgs of Salicin
- 400 mg of 15% salicin is about 6 to 8 grams of Willow bark
- Most willow bark is 1-5 % salicin so therapeutic levels would be up to 18-24 grams or 36 to 48 , 500 mg capsules
- Highest levels of salicin are in stressed and insect damaged willow.

Clinical Case

- 43 year old computer programmer
- History of action in Gulf war
- Chronic , debilitating pain
- No obvious etiology
- RX: Willow bark (Salicin 240 mg a day)
- Boswellia/ Turmeric compound 4 capsule a day
- 90 % reduction in pain in 1 week

Willow Dosages

- 60 to 240 mgs of salicin daily
- Bark: 1-20 grams TID
- Tincture: 5-8 mls TID
- 1/5 wt/ Vol 25% Etoh
- Difficult to take infusion or decoction because of taste

Safety of Willow Bark

- Mild GI irritation, loose stools after 2 months in one study
- Does not inhibit platelets
- Does not cause stomach upset in general
- Use caution in persons with ASA sensitivity or in children with viral infections and the development of Reye's Syndrome
- There is no information available on the toxicology of willow bark
- The toxicity of salicylates is well documented. An

  overdose resulting from acute ingestion of 6.5–9.8 g of

  aspirin usually produces a serum salicylate level of 300 µg/mL or greater.

- More than 50 g/day of salicin would need to be ingested in

  order to achieve this blood level of salicylate, at 10% Salicin content that therapeutic dose would be 500 grams or more than a pound of willow bark.

Clincial Summary of Willow Extract

Clinical Summary

Actions

Anti-inflammatory, analgesic, antirheumatic, antipyretic.

Therapeutic Indications

- Temporary relief of acute or chronic musculoskeletal pain including low back pain, osteoarthritis, rheumatoid arthritis; other inflammatory conditions such as bursitis.
- Temporary relief of mild headache.
- Other painful conditions such as neuralgia and fibromyalgia.

Dosage & Administration

ESCOP recommends willow bark extracts containing up to 240 mg of salicin per day for adults. Clinical trial results suggest that 800–1600 mg/day of a suitably prepared willow bark extract should be administered (at a dosage equivalent to 120–240 mg/day of salicin), with a pain relieving effect observed by the end of the first week for the high dosage and by the second week for the lower dosage.

Suggested Combinations

Willow bark extract could be combined with other anti-inflammatory herbs such as Boswellia, celery seed, turmeric and ginger, and with St John's wort for neuralgia and shingles.

Adverse Reactions

Salicin, being a glycoside derived from salicyl alcohol, is less irritant to the mucous membranes than actual salicylates (salicylic acid derivatives). Unlike aspirin, willow bark extract is expected to have very mild effects on platelet function. Clinicians should be aware of the possibility of Reye's syndrome, an acute sepsis-like illness encountered exclusively in children below 15 years of age. The cause is unknown, although viral agents and drugs, especially salicylates, have been implicated.

Contraindications & Cautions

Willow bark is contraindicated in those with allergy or sensitivity to salicylates and is also contraindicated in glucose-6-phosphate dehydrogenase-deficient patients (in this condition salicylic acid causes haemolytic anaemia).

Use with caution during lactation as salicylates excreted in breast milk may cause rashes in babies.

Source: Willow Bark High Potency Professional Review, by Kerry Bone

Genius of Willow

- *Willow is the water of life, a feminine force of nature that stimulates regeneration and promotes flexibility. Creating a fresh start, and new growth. It contains the essence of Strength, Flexibility and Resilience.*
- "Oh Willow Woman, show me a way to lose the bitterness and resentment."

Contact

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" And I swear the root was this big…"