

Salicin -A natural Analgesic

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Author: Amrit Pal Singh.

Dr Amrit Pal Singh, MD (Alternative Medicine), Medical
Executive, India –Swift Ltd, Super Speciality Division, Chandigarh.

Address for correspondence:

Dr Amrit Pal Singh,
House No: 2101 Phase-7,
MOHALI -160062.
Email amritpal2101@yahoo.com

Abstract

Medicinal herbs constitute important source of drugs. Treatment of diseases with medicinal herbs is called phytotherapy. The study of chemistry of plant derived drugs is known as phytochemistry. Medicinal herbs have given us a number of important drugs, which are mainstays of treatment in synthetic system of medicine. Ayurveda, Siddha, Homeopathy and Herbalism are completely dependent on plants for formulations. Salicin, a glycoside isolated from *Salix alba* attracted the researchers in the 19th century and it provided us with most potent weapon, Acetyl-salicylic acid for killing pain. The article highlights the historical usage and pharmacogenosy of medicinal herbs containing salicin.

(Keywords: Salicin/ Acetyl salicylic acid/ Glycoside/ Analgesic.)

INTRODUCTION

The plant is a biosynthetic laboratory, not only for chemical compounds, but also a multitude of compounds like glycosides, alkaloids etc. These exert physiological and therapeutic effect. The compounds that are responsible for medicinal property of the drug are usually secondary metabolites. Salicin is a glycoside, which acts as a precursor compound for the synthesis of acetyl salicylic acid. Glycoside consists of a carbohydrate molecule (sugar) and a non-sugar component (aglycone). Majorities of them have been isolated from plants and have considerable medicinal value. Digoxin isolated from *Digitalis purpurea* (foxglove) has enjoyed reputation as ‘cardiac tonic’. Thus glycoside in their constituent plants are described as ‘active principles’.

HISTORY

In 1500 B. C. Hippocrates, a Greek physician, prescribed leaves and bark from willow tree to relieve fever and pain. In 200 B.C, native people of North America learn to make

salicylate pain remedies from birch bark. The history of synthesis of acetyl salicylic acid from salicin is very long. The physicians of old era were aware of the fact that *Salix alba* (white willow bark) contains something which has analgesic activity. Researchers in the last century identified and isolated Salicin, a glycoside as active principle. From Salicin, Salicylic acid and finally Acetylsalicylic acid were synthesized. Herman Kolbe synthesized Salicylic acid from coal tar. The method is known as "Kolbe synthesis" in organic chemistry. The modern science will always remain thankful to John Vane, who for the first time explained that Acetylsalicylic acid works by inhibiting the production of prostaglandin, the mediators of inflammation.

CHEMISTRY

Salicin is a glycoside occurring as white crystals or powder.

Molecular Formula: C₁₃H₁₈O₇

Molecular Weight: 286.3.

Melting Point: 159-164°C.

Solubility in: moderately soluble in Water and alcohol.

Purity min: > 99 %.

Toxicity: Not known.

PHARMACOLOGY

No details are present as regard pharmacological studies. In the system, the glycoside salicin splits up into aglycone and salicylic acid. It is excreted as salicylic and salicyluric acids. Salicin does not irritate the stomach as acetyl salicylic acid.

ACTIONS

Analgesic, antipyretic, disinfectant, and antiseptic.

INDICATIONS

For pain relief in arthritis and rheumatism.

CONTRAINDICATIONS

No studies are available but hypersensitivity to salicylate should be ruled out.

DOSE OF SALICIN

1. 250-500mg of the extract standardized to 8% Salicin.
2. 1-2 grains of Salicin.

LIST OF PLANTS CONTAINING SALICIN

1. *Salix alba*.
2. *Salix tetrasperma*.
3. *Salix fragilis*.
4. *Populus nigra*
5. *Populus alba*
6. *Populus tremula*
7. *Filipendula ulmaria*.

SALICIN RELATED COMPOUNDS

Gaultherin, Monotropin, Spiraein are some of known compounds present in plant flora having activity similar to Salicin.

Gaultherin is a glycoside of methyl salicylate and is present in *Gaultheria procumbens* (wintergreen). It is also known as Monotropitoxide and it is used as a source for manufacture of Salicylic acid.

EXTRACTS CONTAINING SALICIN

Salix alba extract is present in market and is used for arthritic conditions. The extract is considered to be more scientific than crude drug preparations like decoction, infusion, fluidextract or tinctures. The standard for these extracts is 8% Salicin.

EXTRACTION OF SALICIN

Depending on the source, the bark of the plant is peeled off and dried under strict aseptic conditions. The properly dried bark is then extracted with 80% ethanol and 20% water. The hydro-ethanolic extract is then subjected to evaporation under reduced pressure.

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References

1. Julkunen-Tuto, R. and Tahvanainen, J. (1989). The effect of sample preparation method extractable phenolics of Salicaceae species. *Planta Medica* 55:55.
2. Vane. J.R. (1971). Salicylates. *Nature* 231:232.
3. Baruah, P. & Swain, T. (1957). *Biochem. J.* 66:321-3.
4. Meier R et al. (1992). A chemotaxonomic survey of phenolic compounds in Swiss willow species. In: *PM* 58(7): A 698.
5. Schmid B, Heide L. (1995). The use of *Salicix* cortex in rheumatic disease: phytotherapie with known mode of action? In: *PM* 61(Abstracts of 43 rd Ann Congr): 94.