



## Tincture Benzoin in Dermatology

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### ABSTRACT

*Benzoin is a drug being used since the ancient times. It is a common designation for resin obtained from a group of Styrax trees. The chief constituents of benzoin resin are benzoin, cinnamic acids and their esters. It is mainly used as a solvent for podophyllin and various cosmetics. It possesses antiseptic, anti-inflammatory and barrier properties due to which it is useful for palmo-plantar fissures, vesicobullous lesions of the mucosae and as a skin hardener. Its adhesive properties are utilized to increase the stickiness of adhesive tapes and surgical drapes. It is cheap, easily available and is a good option particularly in developing countries. Various side effects have been reported most commonly contact dermatitis.*

**Keywords-** *Tincture of benzoin, Benzoin, Resin, Compound tincture of benzoin, contact dermatitis.*

### Introduction

Benzoin is one of the ancient drugs of pharmacy and its use can be traced back to the 15th century. It has enjoyed its popularity under a masquerade of many romantic names, few of them are Turlington's balsam, Friars' balsam, Wade's balsam, Jesuit's drops, St. Victor's balsam, Persian balsam, Swedish balsam and Jerusalem balsam. It is official in the United States Pharmacopeia and the British Pharmacopeia under the title tincture benzoini composita<sup>1</sup>. Tincture benzoin is a relic of a bygone era of dermatology. However, it is not obsolete. It finds use as a solvent for various medicines and cosmetics and as an antiseptic, anti-pruritic and adhesive agent. It is cheap, easily available and is a good option particularly in developing countries.

This article aims to highlight its various uses and side-effects.

### Composition

Benzoin is a common designation for resin obtained from a group of Styrax trees which grow in warm and tropical regions. The resin is produced after incisions are made into the bark of trees that are at least seven years old. The resin hardens to give a grey-brown solid with a vanilla-like odor. The chief constituents of benzoin resin are benzoin, cinnamic acids and their esters. In addition, traces of vanillin, benzaldehyde, styrol and styracin are also present. Up to one-third of the resin is benzoic acid which is a food preservative and has mild anti-microbial properties. The resin comes in different forms and

qualities depending on where it is harvested. Among the commercial preparations, the most important are Siam benzoin (also known as Frair's Balsam) derived from *Styrax tonkinensis* and Sumatra benzoin derived from *Styrax paralleloneurus* and *Styrax benzoin*. In Sumatra benzoin, cinnamic acid predominates but in Siam benzoin, benzoic acid is more abundant.

Tincture of benzoin is made by soaking benzoin resin in alcohol. The purest resins will dissolve completely, but lesser grades require filtering. What remains is usually a 10 percent solution of benzoin resin. The tincture is of a brown-red color and is acidic in reaction.

Compound tincture of benzoin (CTB) is a mixture made of four naturally occurring resins: benzoin, aloe, storax and tolu balsam in alcohol and can also contain myrrh and angelica and occasionally balsam of Peru<sup>2</sup>.

**Table 1:** Formula for compound tincture of benzoin

Substance	Quantity (%)
Benzoin	10
Aloe	2
Storax (styrax)	8
Tolu balsam	4
Alcohol 95%q.s.ad	

Benzoin oil is an extract of the resin made using organic solvents which are then evaporated leaving behind water insoluble fraction of the resin. This oil is used to clear chest congestion.

Benzoin resin or tincture should not be confused with benzoin used in the polymer industry. This white crystalline chemical is unrelated to the plant material and does not have any medicinal uses.

**Dermatological Uses**

**As a solvent for medicines and cosmetics-**

**Podophyllin** is used in the treatment of venereal warts. It is prepared by mixing 10-40% podophyllin in tincture benzoin. As cell-mediated immunity appears to be the principal mechanism for the rejection of warts, the resolution of the warts following podophyllin application could be attributed to both the action of podophyllin and the inflammation resulting from contact dermatitis due to benzoin and alcohol. Lakshmi et al<sup>3</sup>

recommended that patients complaining of burning and irritation following the use of tincture podophyllin may be patch tested with tincture benzoin.

**Cosmetics-** Gum benzoin has been used to beautify skin since ancient times. Mixture of gum benzoin and glycerin has been used to treat chapped hands and lips. A cosmetic preparation, known as LAC VIRGINIS, or Virgin's milk, prepared by mixing various amounts of rose water (from 20 to 100 parts) with 1 part of tincture of benzoin has been used as a face rinse and skin cleanser.

Benzoin may also be present in nail polish, adhesives, perfumes, barrier creams and as an anti-oxidant in creams and cosmetics<sup>2</sup>.

**Table 2:** Various products in which benzoin may be found

Nail polish	expectorants
Arnig's mixture	Throat lozenges
Raw beewax	perfumes
Bee glue	Water repellent barrier creams
Antioxidants in creams and cosmetics	Benzoinated lard
Preservatives in adhesives	Cuticle removers
Adhesives themselves	ink

**Fissures-**Tincture benzoin when applied on the palmo- plantar fissures causes occlusion of the gap and prevents further extension and superadded infection due to its antiseptic properties. The compound is fluid impermeable and physically prevents drying out of the skin keeping it supple, promoting rapid healing and is also said to promote the growth of granulation tissue. They also improve the adhesion of the occlusive tapes applied<sup>4</sup>. An infrequently mentioned but common use in obstetrics is the local application of this tincture in the treatment of fissured nipples. Williams recommends this compound for the treatment of this condition<sup>5</sup>.

**Vesicobullous lesions of the mucosae-** tincture benzoin has been used as oral mucosal protectant in herpes simplex of the lips, aphthous stomatitis and lesions of trench mouth in infants and Vincent's infection. Almost immediate relief from pain and noticeable decrease in edema has been noted. It has

also been reported to be beneficial in relieving pain in a case of lingua geographica in a 6-year old white boy<sup>1</sup>.

**Skin hardner-** Its use also extends to the defence forces and athletes where it has been used as a skin-toughening agent and to help prevent blister formation. A common treatment utilized by medics in the U.S. Army is to drain the fluid from a blister and then inject enough compound tincture of benzoin into the void to glue the blister to the underlying skin, to serve as a local antiseptic and to prevent further abrasion or loss of skin. Tincture benzoin applied to pressure points on bedridden patients aids in preventing the bedsores. This has been attributed to both benzoin resin which forms an impermeable layer and to the alcohol content which causes denaturation of the surface proteins and makes the skin hard. It is also used as a 'chemical mask' to protect healthy skin around verrucae when caustic occlusive dressings are applied in chemical cautery.

**Antiseptic and antibiotic properties-** The antiseptic effect of the tincture is probably dependent on the benzoic and cinnamic acids contained in the benzoin and storax, two of the active ingredients of the compound, while the strong alcoholic content of the pharmaceutical preparation possibly has some additional antiseptic and dehydrating effect on the edematous tissue<sup>1</sup>. This property has been utilized in several surgical specialties. Marsalic et al<sup>6</sup> have used tincture benzoin paint on the incision site on the skin after regular scrubs for over 15 years and have found it effective in treating a variety of infections including multiple aerobic, anaerobic and spore-forming bacteria as well as *Candida albicans* and *Mycobacterium fortuitum*. In addition, its adhesiveness assists in sticking of the operative drapes to the skin. Wascher et al<sup>7</sup> studied the effect of exposure to tincture of benzoin solution on multiple aerobic, anaerobic, and spore-forming bacteria as well as *Candida albicans* and *Mycobacterium fortuitum* and found that *Bacillus cereus* was the only index organism demonstrating a clear ability to survive a 15-minute incubation in

tincture of benzoin, although 24 hours of exposure to tincture of benzoin resulted in no subsequent viable cultures. However, the postoperative use of tincture should be judicious as it can attract dust particles and other impurities from the surroundings<sup>6</sup>.

**Perianal dermatitis-** Patients of perianal dermatitis with acute moderate to severe changes of the skin are treated by application of Berwick's dye (combination of gentian violet and brilliant green). The dye is dried with compressed air or a hair dryer. Benzoin tincture is applied over top of this as a barrier and dried similarly. This preparation will stay in place for several days if only water is used to cleanse and gives relief of symptoms and allows re-epithelialization of broken skin.

**Ingrown toenails-** Compound tincture benzoin soaked cotton wool pack in the nail sulcus, inserted between the corner of the nail and the nail fold can be used for packing. This stays on for a week or so. The packing gives immediate pain relief and results in early stages are good.

**Chronic paronychia-** tincture benzoin applied to nail folds makes a barrier to prevent the entry of irritants and aids in faster healing. However, exogenous nail pigmentation can occur.

### Other Uses

Sumatra benzoin is less allergenic and is the form used for inhalations. It is added to water and glycerin in preparing steam inhalations for bronchitis, asthma and other respiratory disorders. However, a small study found that relief from congestion was similar using steam from boiling water alone compared to boiling water with benzoin tincture.

Tincture benzoin has been used to increase the tackiness of adhesive tapes and is particularly useful for areas that are usually difficult to dress such as the angle of the mouth, the perianal area or the nipples<sup>2</sup>.

Orthopedists applying a cast often spray CTB in an aerosol can onto skin before casting as it protects the underlying skin and diminishes itching.

It has also been used in incense stick manufacturing and aromatherapy since medieval times.

It is sometimes mixed with lards and fats to prevent them turning rancid.

### Side Effects

**Local irritant-** Local application of the undiluted tincture to broken tissues produces considerable irritation because of the high alcoholic content of the pharmacopoeial tincture. Tincture benzoin injections in blisters are known as "hot shot" amongst military personnel due to the extreme burning sensation that will be experienced for several moments when the tincture is applied. To reduce this side-effect, dilutions of compound tincture of benzoin with glycerin and water have been suggested. Ointments containing compound tincture of benzoin have been used as an alternative but only relatively small quantities of the tincture are ordinarily prescribed in them and owing to the inability of most ointment bases to absorb and retain appreciable amounts of liquids and hence, are less effective<sup>8</sup>.

**Contact dermatitis-**The first case of benzoin allergy was reported in 1874. There have been few reports of contact allergy to suggesting that compound tincture benzoin is in fact not a strong sensitizer. Allergy has been seen where compound tincture benzoin is used under a plaster cast, on abrasions, on fissured nipples, for increasing the tackiness of dressings, on a rhinoplasty dressing, as an antiseptic, as palliation of pruritus ani and in grease-paint make-up<sup>2</sup>. Cross-reaction to similar allergens (fragrance mix, balsam of Peru, colophony, and tea-tree oil) have also been reported in patients with contact dermatitis to tincture benzoin. Benzoin can also cross-react with storax, eugenol, vanilla, alpha-pinene, benzyl alcohol and benzyl cinnamate, as they are all similar in chemical structure<sup>3</sup>. Scardamaglia et al<sup>2</sup> patch tested 477 patients out of which 45 had positive reaction to compound tincture benzoin but only were clinically relevant. Twenty-eight of these patients had cross-reactions to similar allergens (fragrance mix, balsam of Peru, colophony and tea tree oil). If the

individual is allergic to benzoin, a tape adherent containing abietic anhydride, parachloro-metaxyleneol and chlorinated solvents may be applied beneath adhesive tape which helps to minimize its contact with the skin<sup>2</sup>. Alternatively, gum mastic obtained from the Mastic tree is an alternative with superior adhesive qualities and a lower incidence of complications. However, it is not commercially available<sup>3</sup>.

**Generalised exanthem due to benzoin** absorbed through skin when applied under occlusion has been reported by Spot et al<sup>9</sup> in a patient to whom CTB was applied on leg prior to cast. The patient developed papulovesicular dermatitis on the leg on 23rd day. After 48 hours of dermatitis, a patchy morbiliform eruption developed symmetrically on upper arms, chest and back.

**Exacerbation of pemphigus by allergic contact dermatitis-**Lynfield et al<sup>10</sup> have described a case of pemphigus erythematosus in whom the disease was exaggerated after an episode of contact dermatitis to compound tincture benzoin applied to a dressing. The patch test reaction to tincture benzoin was positive.

**purpuric eruption after inhaling a vapour** containing compound tincture benzoin applied has been reported<sup>2</sup>.

A small number of cases of poisonings have been reported when people mistakenly drank benzoin tinctures intended for use as inhalants. Severestomach irritation occurred leading to bleeding into the stomach and stools. Patients recovered completely after several days.

### Conclusion

Keeping in mind the low cost and easy availability of tincture benzoin, it is a viable alternative for other costly compounds in developing countries. However, care must be taken while applying on raw areas and the possibility of contact dermatitis should be kept in mind.

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