



## Ethnomedicinal properties of propolis and its usages in historic zootherapeutic practices

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### Abstract

Propolis is a natural resinous mixture produced by honeybee *Apis mellifera* from substances collected from parts of plants, buds and exudates. Bees gather propolis from different plants, in the temperate climate zone mainly from poplar. Current biological applications of propolis include formulations for cold syndrome (upper respiratory tract infections, common cold, flu-like infections), wound healing creams, eye treatments, Asthama, treatment of burns, acne, dabities, mouthwashes and toothpastes to prevent caries and treat gingivitis and stomatitis. It also possesses the antifungal activities in ocular and vaginal infections. South Indian Propolis possesses antimicrobial, antifungal, antiviral, immunostimulatory, antiinflammatory, anti-cancer and anti-oxidant activity. Worldwide propolis has a tremendous popularity; but in India, studies over propolis are not done extensively. The need of the hour is to explore its possible Pharmaceutical and Biological activities.

**Keywords:** propolis, healing agent, ethnomedicinal properties, zootherapeutic practices, biological activities

### Introduction

The name “Propolis” consists of two Greek words: pro – “front” and polis - “city, fortress” i.e., all together – “the protection of the fortress”, where the strength means almost one hundred thousandth of the family of one hive. Thus, even in ancient times balsamic, mummified properties of the bee glue were known. Propolis is very popular, because of its beneficial effect on human health Propolis have been extensively employed by man since ancient times, especially in folk medicine to treat several maladies. Egyptians knew very well its anti-putrefactive properties and used bee glue to embalm their cadavers. Incas employed propolis as an anti-pyretic agent <sup>[1]</sup>. Greek and Roman physicians used it as mouth disinfectant and as an antiseptic and healing product in wound healing treatment, prescribed for topical therapy of cutaneous and mucosal wounds <sup>[2]</sup>. In Folk Georgian medicine, they used ointments with propolis to cure some diseases. There was the custom of placing a propolis cake on the belly button of the new-born baby and also they rubbed children’s toys with propolis. In folk medicine, the use of propolis is widely known especially for the treatment of corns. People inhale propolis in case of affections of respiratory tracts and of the lungs. It is also efficient for burns and angina. Propolis was used effectively on wounds by doctors during the Anglo- Boer war and during World War II. It was also used in hospitals from 1969 <sup>[3]</sup>. This product has, therefore, gained popularity as a traditional (folk) medicine for health amelioration and disease prevention <sup>[4]</sup>. Some examples including its utilization for increasing the body’s natural resistance to infections and lowering blood pressure and cholesterol levels. It has been also used in mouth wash products and toothpastes to prevent Caries and treat Gingivitis and Stomatitis <sup>[5]</sup>, in Cough Syrups, Oral Pills, Lozenges, Ointments, Lotions, and Vitamins <sup>[6]</sup>. Therapists often use propolis for the relief of some inflammations, viral diseases,

fungal infections, ulcers and superficial burns along with acupuncture, Ayurveda and homeopathy. Propolis is available in the world markets in different forms as capsules, lozenges, tincture and cream in Europe and America. It is already available in Russia as toothpaste. Further, research is being carried out at Oxford University, on the benefits of Propolis <sup>[7]</sup>. In ancient times, propolis has been widely used by different cultures for differing purposes, among which its use in medicine is included <sup>[8, 9]</sup>. Currently; research is being carried out on its activity, effects and possible uses in biology and medicine. The most prominent are its application as a dietary supplement, its use in the pharmaceutical industry and clinical applications in animal science <sup>[10, 11]</sup>.

### Composition of propolis

Composition of propolis is 50-60% fragrant resin consisting of a variety of different substances, amino acids, proteins, carbohydrates, balms (6%), consisting of cinnamic acid and cinnamic alcohol (Park 2002). Besides, propolis contains enzymes, ferulic and benzoic acid, antibiotics, essential oil (5 to 15%), fatty oils, and vitamins A, B1, B2, E, C, PP, aldehydes, flavones, flavonols, and 30% wax, up to 5% of pollen and many trace elements (aluminum, vanadium, iron, calcium, silicon, manganese, strontium).

### Properties of propolis

Since ancient times, propolis is used by man as a natural product with diverse healing properties. Propolis, free of impurities (pieces of pure wax, small wood chips, residues and dead bees, etc.), and its preparations for its valuable chemical and biological composition have a wide range of medicinal properties <sup>[12]</sup>. They have a pronounced anti-inflammatory, anti-microbial and anti-viral, anti-cancer, antibiotic, antifungal, antiseptic healing properties. Propolis has a detrimental effect on gram-positive bacteria, especially the

tubercle bacillus, which is especially important for people with tuberculosis which is not curable with antibiotics pharmacy. Additionally propolis has strong analgesic properties (such as in cocaine, and more), stimulates regeneration (recovery) processes, limits the development of scars and accelerates wound healing, inflammations, burns, improves blood and lymph circulation, dramatically reduces the permeability of the burn wound surface <sup>[13]</sup>. Propolis is non-toxic, even after long-term use does not inhibit the useful microflora of the digestive tract, does not lead to dysbiosis and the reducing of natural immunity. On the contrary, propolis increases the body's defenses. At the same time, propolis inhibits the development of pathogenic bacteria that infect man, including candidiasis, so propolis acts selectively on the microorganisms and in favor of the human body. Propolis increases the activity of antibiotics such as penicillin, streptomycin, tetracycline, neomycin, etc. Propolis expressed inhibits and prevents the formation of blood clots in the blood vessels, improves blood circulation, reduces inflammation in endarteritis, atherosclerosis, and strengthens the immune system and the body's resistance to infections and other adverse factors environment <sup>[14]</sup>.

#### **Treatment with propolis**

Propolis is increasingly used for the treatment of various diseases. There are many cases of successful use of propolis in a number of diseases whose treatment by other means was ineffective. Pronounced therapeutic effect is observed with propolis applied topically to the inflammatory diseases of the ear, nose, throat and mucous membranes of the mouth, skin diseases, treatment of burns and difficult wounds. Propolis is also effective in the treatment of hepatic and chronic diseases of the prostate <sup>[15]</sup>. It is known also about the successful use of it for cervical erosion.

#### **Creams and Lotions**

Propolis is used as cream or lotions for different cosmetic purposes. The propolis uses for cosmetics have been investigated <sup>[16, 17]</sup>. Its use is based on the antibacterial, antifungal, anti-viral anti-acne, antiinflammatory, antioxidant effects, epithelial, micro-circulation and topical anaesthetic effects. Low toxicity and good skin compatability have been demonstrated, despite the risk for allergic reactions. For skin lotions and creams for cosmetic use 1-2 % propolis seems to be the appropriate amount <sup>[18]</sup>. However, before use a test on a small skin surface should be made, if there is a propolis allergy problem. The possible allergising effects should be marked on the product.

#### **Propolis treatment of children**

In the children's clinic propolis as an aerosol has been used successfully for the prevention and treatment of upper respiratory tract catarrh, pharyngitis, tracheitis, pneumonia and chronic asthma in children (inhalation use of propolis as an emulsion in oil rose, apricot oil, or in a dilution of 1:3, 1: 2 and 1:1 – 20 sessions, lasting 1-3-5 min) <sup>[19]</sup>.

#### **Propolis for the treatment of skin diseases**

50% ointment with propolis with some vegetable oil provides

effect in the treatment of some diseases of the skin-dermatitis (trichophytosis, hyperkeratosis, lupus). In this case, you put thick ointment with propolis, cover it with wax paper for 1-3 days. Course of treatment – 1-2 months, this treatment is a painless wound healing, cosmetic scarring <sup>[20]</sup>.

#### **Propolis to treat hair loss**

For the treatment of placing and total hair loss 30% propolis tincture with 96 percent alcohol is applied as daily rubbing of the skin.

#### **Propolis for the treatment of poriasis**

The daily use of 0.5-2 g of pure propolis inside after meals 2-3 times a day for 2-3 months significantly alleviates the condition or lead to full recovery <sup>[21]</sup>. In parallel you impose swabs soaked with 10% propolis ointment with lanolin or vegetable oil to the affected areas. It is useful to use daily at night 50-100 g of honey mixed with bee bread for the good general state of the organism <sup>[16]</sup>.

#### **Propolis to heal wounds**

Propolis has been successfully used for the treatment of difficult, festering wounds, chronic neurodermatitis, acute, chronic and microbial eczema, skin fungal diseases, radiation skin lesions by putting gauze dressings impregnated with 10-30% propolis ointment on vegetable oil <sup>[22]</sup>. This decreases or completely stops the itching and pain, then comes the recovery.

#### **Propolis to treat stomach ulcers**

For gastric and duodenal ulcers you can use the tincture of propolis on unsalted butter. 10% tincture of propolis on 96 percent alcohol is infused for 3-5 days, mixed with butter in a ratio of 10:1, boiled, filtered hot through cotton wool and take 20-30 drops with water or milk 3 times a day 1 hour before meal. Course of treatment: 20 days. Some patients like if this potion is not made with butter, but the sea-buckthorn oil. Other patients use 1 tsp with the warm milk also 3 times a day 1 hour before meal. Likewise you can treat gastritis, acute and chronic colitis. Many patients prefer to take 20-30% propolis tincture, 60 drops in a cup of milk 3 times a day 30 minutes before meals when a stomach ulcer. We must remember that treatment with propolis increases the acidity of gastric juice <sup>[23, 24]</sup>.

#### **Propolis in dentistry**

Treatment of root canal and periodontitis <sup>[25]</sup> suggested the addition of 4% alcohol solution of bee glue as filler for root-canal filling, besides the traditional treatment of the root-canal with bee glue solution. Clinical and radiographic examinations have demonstrated a high efficacy of such technique in acute, exacerbated and chronic forms of periodontitis. This filler is characterized by its anesthetizing effect. It is preserved in the root canal and does not stain the tooth crown, promotes regeneration of the bone structure and prolongs the effect of 0.4% water-alcohol bee glue emulsion, studied Sodium hypochlorite as an endodontic irrigant, possesses problems of toxicity, odor and discoloration of operatory items. An equally effective, but safe irrigant is desirable.

### **Propolis for the treatment of sinusitis**

When you have purulent antritis and when antibiotics and sulfanilamides have no effect, 10% weekly propolis tincture with 96 percent alcohol helps, which is injected into the maxillary sinus by puncture: 2-5 punctures at intervals of 2-3 days. When intolerance you can dilute this infusion with distilled water. It is only necessary to use a tincture carefully filtered and warmed to body temperature. At home with purulent sinusitis you make nasal dripping of the 20% weekly infusion with 96 percent alcohol, diluted in half with sunflower, sea buckthorn or other vegetable oil, if the tincture acts too annoying, then use 20-30% water decoction of propolis. When a cold you can use 20% propolis tincture with 96 percent alcohol, diluted in half with water. Inject it into the sinuses on a gauze pads, soaking in this tincture, or drip in the nose 20% aqueous extract of propolis, 5 drops at times <sup>[26]</sup>.

### **Propolis for the treatment of sciatica**

Radiculitis – put pure propolis (100-200 g), cover with wax paper and apply a heating pad at night. Course of treatment: 5-8 nights. You can use instead compresses with 20% propolis tincture with 96 percent alcohol at night <sup>[27]</sup>.

### **Propolis in gynaecology**

When inflammation of the vagina and cervix, caused by pathogens (trichomoniasis, staphylococcus, streptococcus, etc.), you can use douching or tampons soaked in 3% weekly propolis tincture with 96% alcohol <sup>[28]</sup>. Douching or grouting should be done daily, preferably overnight, for 7-10 days. The effect of treatment is higher than the use of traditional medicines. Only 1% of patients have allergic phenomena which ceased after the abolition of propolis <sup>[29]</sup>. Difficult wounds after gynaecological operations heal better and faster after daily wetting of wounds with 15% propolis tincture with 96 percent alcohol. When mastitis it is good to lubricate cracking skin several times a day with 10% propolis ointment with butter or vegetable oil <sup>[30]</sup>.

### **Propolis for prostate**

When inflammation of the prostate you use inside 20% propolis tincture and suppositories – sticks of propolis extract and cocoa butter. Propolis extract is prepared as follows: 40 g of crushed propolis mix with 200 ml of 96 percent alcohol, store 10 days with daily shaking, then the alcohol is evaporated by boiling. Pour 2 g cocoa in the resulting mass and stir thoroughly. From this mass you make sticks, which are injected into the rectum at night. Course of treatment: 3 to 30 days. Such treatment is observed removal of inflammation, the disappearance of pain and a significant improvement of the patient <sup>[31, 32]</sup>.

### **Anti-cancer properties**

Ethanol extracts of propolis have been found to transform human hepatic and uterine carcinoma cells *in vitro*, and to inhibit their growth <sup>[33]</sup>. Propolis was also found to have a cytotoxic and cytostatic effect *in vitro* against hamster ovary cancer cells and sarcoma-type tumours in mice. A substance called Artepillin C has been isolated from propolis, and has been shown to have a cytotoxic effect on human gastric

carcinoma cells, human lung cancer cells and mouse colon carcinoma cells *in vitro*.

### **Conclusion**

Propolis is one of the few natural remedies that have maintained its popularity over a long period of time, propolis has been shown to lower blood pressure and cholesterol levels. However, clinical studies to substantiate these claims are required. Until this becomes available, physicians should weigh the benefits of propolis as an adjuvant therapy for the good of cancer patients. It is therefore comprehensible that we should now switch on to-back to nature approach where propolis seems a promising alternative medicine for the control of different diseases with good response and lower associated risks. This paper reviews various clinical implications of propolis to improve the human and animal health. Propolis can be used in the management of dental caries, endodontic as well as periodontal infections, vital pulp therapy, in the treatment of oral lesions and repair of surgical wounds. It helps in recovery of eye cataract, vagina - uterus cervix inflammation, chronic inflammatory disorder of the pulmonary airways and nasal obstruction in human. Furthermore, propolis is a useful substance used in medicine and acts as an excellent adjuvant.

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