A REVIEW OF PROPOLIS

Anuja V. Gaikwad¹, Prachi P. Barse² Rameshwar D. Borkar³, Dr. Swati Deshmukh⁴

1²³⁴ Shraddha Institute of Pharmacy Kondala Zamre, Washim (MS) 444505.

Abstract:
Propolis is a natural product deduced from factory resins collected by honeybees. It's used by notions as cement, a general-purpose sealer, and as a draught-excluder for beehives. Propolis is a natural resinous amalgamation produced by honeybees from and exudates. Due to its malleable nature and mechanical parcels, sundries use propolis in the construction and form of their hives for sealing openings and cracks and smooth out the internal walls and as a protective barricade against external aggressors like snakes, lizards etc., or against riding risks like wind and rain. It's known that propolis possesses anti-microbial, antifungal agent, buccal crack mending agent, antioxidant parcels, and anti-tumor conditioning. notions gather propolis from different shops, in the temperate climate zone substantially from poplar. Current antimicrobial operations of propolis includes phrasings for cold pattern (upper respiratory tract infections, common cold wave, flu-suchlike infections), crack mending, treatment of becks, acne, herpes simplex and genitalis, and neurodermatitis. also, propolis is used in mouthwashes and toothpastes to help caries and treat gingivitis and stomatitis. It's also cortege the antifungal conditioning in optical and vaginal infections

Keywords: Bee propolis, propolis sources, temperate zone, propolis biological Activities, antioxidant properties, antifungal, and uses.

INTRODUCTION:

Propolis is a natural resinous mixture produced by honeybees from substances collected from parts of plants, various types of flowers, various buds and exudates. morphologically the word propolis derived from the Greek pro (for ‘in front of’, ‘at the entrance to’) and polis (for ‘community’ or ‘city’), meaning that this natural product is used for hive defense. Another name of propolis is bee glue. Due to its waxy nature and mechanical properties, bees use propolis in the development and repair of their hives,[2] for sealing openings and break and smooth out the internal walls [1,3] and as a protective barrier against external invaders like snakes, lizards etc. or against weathering threats like wind and rain. Bees collect propolis from different plants, in the temperate climate zone mainly from poplar.

Propolis is a gummy, sticky mixture gathered from trees by the Apis mellifera bee, which uses as a building insulating material in the bee hive as well as for keeping it in favorable health [6]. It has important pharmacological properties and it can be used for a wide range of purposes as anti-inflammatory and hypotensive agent, immune system stimulant, and bacteriostatic and bactericidal agent, various many other uses [7]. Propolis contains some minerals such as Mg, Ca, I, K, Na, Cu, Zn, Mn and Fe as well as some vitamins like B1, B2, B6, C and E, and a number of fatty acids. In addition, it contains some enzymes as succinic dehydrogenase, glucose-6-phosphatase, adenosine triphosphatase and acid phosphatase [4]. Propolis contains copper 26.5 mg/kg, manganese 40 mg/kg and the ash residue contain iron, calcium, aluminum, vanadium, strontium, manganese and silicon [5].

Honey and propolis both are veritably popular because of their salutary effect on mortal health Propolis have been considerably employed by man since ancient times, especially in folk drug to treat several distemperatures. Egyptians knew veritably well its antiseptic and anti-inflammatory, antiviral, antifungal properties, used as mouthwash and as a topical application. Greek and Roman croakers used it as mouth detergent and as an antiseptic and mending product in crack treatment, specified for topical use of cutaneous and mucosal injuries [12]. These remedial operations were eternalized in the middle age and among Arab croakers. Listed as a sanctioned medicine in the London pharmacopoeias of the 17th century, propolis came veritably popular in Europe between the 17th and 20th centuries due to its antibacterial exertion. In Italy, Stradivari used fresh cement as a violin shield [8]. In the end of 19th century, propolis was extensively used due to its mending parcels and in the Second Global War it was employed in several Soviet conventions for tuberculosis treatment, due to the observed decline of lung problems and appetite recovery. In the Balkan countries it was one of the most constantly used remedies, applied to treat injuries and becks, sore throat and stomach ulcer [9]. The first scientific work with propolis, reporting its chemical parcels and composition, was published in 1908, and listed to Chemical objectifications [10]., latterly, in 1968, the first patent [11] was attained to produce bath poultices in Romania.

Currently, propolis is a natural remedy set up in numerous health food stores in different forms for topical use. It's also used in cosmetics or as a popular indispensable drug for tone-treatment of colorful conditions. Current operations of propolis include phrasings for cold pattern (upper respiratory tract infections, common cold wave, flu-suchlike infections), as well as dermatological medications useful in crack mending, treatment of becks, acne, herpes simplex and genitalis, and neurodermatitis. also, propolis is used in mouthwashes and toothpastes to help caries and treat gingivitis and stomatitis. It's extensively used in cosmetics and in health foods and potables. It's commercially available in the form of capsules (either pure or in excepts), mouthwash results (combined with bomb attar, savant, mallow), creams, throat tablets, greasepaint and also in numerous purified products from which the wax was removed and it's extensively used in mortal and veterinary drug, pharmacology and cosmetics.

Melting Point:
At temperatures of 25 °C to 45 °C propolis is a soft, pliable and veritably sticky substance. Particularly when firm or at near freezing, it becomes hard and brittle. It'll remain brittle after similar treatment indeed at advanced temperatures Above 45 °C it'll come decreasingly sticky and sticky. Propolis will come liquid at 60 °C to 70 °C, but for some samples the melting point may be as high as 80 °C.

Solubility of propolis:
Propolis cannot be used directly as raw material due to its complex structure. The most common detergents used for marketable birth are as follows water, methanol, ethanol, chloroform, dichloromethane, ether, and acetone. Numerous of the bactericidal factors are answerable in water or alcohol [13]. These detergents remove the inert material and save the asked composites. styles of birth also affects on propolis exertion [14].

**Propolis sources in the temperate zone:**
The first papers to dissect propolis grounded on chemical substantiation appeared in the 70’s Lavie [15] in France and Popravko [16] in Russia anatomicized propolis flavonoid compo- sition and compared it to poplar and birchbud exudates, independently. Numerous other cantina - lications followed and now it's generally accepted and chemically demonstrated that in temperate zones the cub exudates of Populus species and their mongrels are the main source of freak cement. This is true for Europe [19,23,18,16,17], North America [22], and the non-tropical regions of Asia [20,21]. In deed in New Zealand, introduced poplar species are the source shops [24]. In Russia how- ever, and especially in its northern corridor, birch kids (Betula verrucosa) force notions with the good cement [16].

**PROPOLIS BIOLOGICAL ACTIVITIES:**
Due to its different remedial parcels, and its composition chemical uproariousness, propolis has come a focus of interest in numerous areas of scientific exploration, seeking to discover new curatives to treat numerous conditions like diabetes, excrecence, bacterial infections, antipathetic rhinitis, and ulcers.[34] Propolis active composites have antibacterial, antifungal, antiviral, anti-inflammatory, antioxidant, antiexcrecence, immunomodulatory, hepatoprotective, antidiabetic, and mending parcels (Fig. 1)[35,36,37,38,33] Its essential oil painting also contains terpenoids, sweet and aliphatic composites that parade antibacterial exertion[39,40] and inhibits lipid peroxidation[40,41]. In this review, we concentrate solely on the use of propolis topically, whether it's for remedial or for ornamental purposes.

![Antioxidant properties](image)

**Antioxidant properties:**
The antioxidant exertion of propolis has been observed in topical phrasings to help and treat skin conditions, as well as aging (Fig. 1). A healthy skin depends upon the balanced presence of free oxygen revolutionaries, of which high situations can cause cell death and aging. Free revolutionaries are defined as any species that contains one or further unmatched electrons, able of being singly [25]. Oxygen In its ground state has two unmatched electrons and can act as an oxidizing agent [26]. In addition, ROS are generated by all aerobic cells, as by- products of colorful metabolic responses and in response to different stimulants [27,28]. Under specific stress conditions, the ROS situations exceed the antioxidant capacity of a cell, establishing an imbalanced condition appertained to as oxidative stress. This situation can be deduced from a reduction in the antioxidant defense system due to the reduction of factors of this system or mutations that compromise its functions. Oxidative stress can also affect from the increased product of ROS due to exposure to the composites that induce them and/ or spark ROS systems and/ or hypertopic conditions or both [31,32]. Polyphenols and flavonoids (the major ingredients of propolis) can also act by different antioxidant mechanisms, including the inhibition of the enzymes involved in the conformation of reactive oxygen species (xanthine oxidase, protein kinase C, lipoxygenase, cyclooxygenase, and oxidation of nicotinamide adenine dinucleotide). It has also been described to chelate trace rudiments, which are implicit enhancers of the generation of free revolutionaries, or to act indeed as stabilizers of these revolutionaries involved in oxidative processes by forming complexes with them [29,26]. In deed though propolis has numerous active composites that have formerly been delved for colorful organic diseases, only many reports have concentrated on its antioxidant natural responses in topical phrasings. A study by [30]. compared honey with propolis set up in a region of Algeria, regarding its antioxidant exertion. The excerpts of propolis presented significantly advanced exertion than honey. The antioxidant exertion measured through the reduction test indicated advanced exertion in propolis in excerpts with methanol, showing the relation of phenoic factors and antioxidant exertion. A functional conflation with 11 composites uprooted from Brazilian red propolis containing echium oil painting, nascence- linolenic acid, steardonic acid, and factory sterol esters, with or without phenolic composites, was anamorized. Oxidative labels, similar as hydroperoxides, thiobarbituric acid reactive substances, and phytoester oxidation products were estimated. Their oxygen radical absorbance capacity was also tested. Experimenters set up that synapic acid and rutain, both present at high amounts in the ethanolic excerpt of propolis from Alagoas, a northeastern state of Brazil, showed the same antioxidant exertion as tert- butylhydroquinone (standard antioxidant) and should be farther delved as a implicit natural antioxidant that could be applied in a functional emulsion.[31]
Anti- fungal agent:
Vaginal use:
Antifungal exertion of propolis ethanol excerpt (PEE) and propolis micro patches (PMs) attained from a sample of Brazilian propolis against clinical incentive isolates of significance in the vulvovaginal candidiasis (VVC). PEE was used to prepare the micro patches. Incentive isolates (n = 89), attained from vaginal exudates of cases with VVC, were exposed to the PE and the PMs. also, the main antifungal medicines used in the treatment of VVC (Fluconazole, Voriconazole, Itraconazole, Ketoconazole, Miconazole and Amphotericin B) were also tested. MIC was determined according to the standard broth micro dilution system. Some Candida albicans isolates showed resistance or cure dependent vulnerability for the azolic medicines and Amphotericin B. NonCandida albicans isolates showed further resistance and cure dependent vulnerability for the azolic medicines than Candida albicans. still, all of them were sensitive or cure dependent susceptible for Amphotericin B. All provocations were inhibited by PEE and PMs, with small variation, independent of the species of incentive [43].

Buccal wound healing agent:
Propolis is used in crack mending. Magro- Filho and Carvalho, were reported that the goods of propolis mouth wash on the form of surgical injuries after sulcoplasty by the modified Kazanjian fashion [44]. Cases returned 7, 14, 30 and 45 days after surgery for cytological and clinical evaluation. It was concluded that
a. The mouth wash containing propolis in waterless alcohol result backed form of intra-buccal surgical injuries and wielded a small pain payoff and anti-desisious effect.
b. The vehicle employed had a minor irritant effect on infra- buccal surgical injuries.
c. Exfoliative cytology showed epithelization of infra- buccal surgical injuries. They also examined histologically the goods of propolis topical operation to dental sockets and skin injuries. It was concluded that topical operation of propolis hydro- alcoholic result accelerated epithelial form after tooth birth but had no effect on socket crack mending.

Antitumoral Activity:
The antitumor exertion of propolis was reviewed by Orsolic et al. The chemopreventive exertion of propolis in beast models and cell societies is likely to be the result of their capability to inhibit DNA conflation in tumour cells, their capability to induce apoptosis of tumour cells, and their property to spark macrophages to produce factors able of regulating the function of B, T and NK cells, independently. also, these results suggest that flavonoids from propolis play a defensive part against the toxin of the chemotherapeutic agents or radiation in mice, giving stopgap that they may have analogous defensive action in humans. The combination with an adjuvant antioxidant remedy may enhance the effectiveness of chemotherapy by upgrading the side effect on leukocytes, liver, and feathers and accordingly enabling cure escalation [45]. Although numerous polyphenol have an antitumoral exertion, caffeic acid phenethyl ester (CAPE) from poplar propolis and Artepillin C from Baccharis propolis have been linked as the most potent antitumor agents [46-47]. The in vitro anticarcinogenic eventuality of propolis in mortal lymphocytes was delved. Blood samples were attained from ten healthy males, nonsmoking levies, which were incubated and exposed to adding attention of propolis (0.01, 0.1, 0.2, 0.5, 0.7, and 1.0 mL). The mean micronucleus rates were ~4.0270.64. Mitotic indicator rates were between19.4572.22 and. The differences between the control and exposed cells were statistically significant (pp 0.05). Exposure to different attention of propolis cannot produce a carcinogenic effect in supplemental mortal lymphocytes in vitro. still, adding micronucleus (MN) rates showed that propolis could have a carcinogenic effect in high attention [48].

Anti-Inflammatory Activity:
Inflammation is the complex natural response of vascular apkins to dangerous stimulants, similar as pathogens, damaged cells, annoyances, and free revolutionaries. Antiseditious exertion means the primary effect of the host defense system. The anti-inflammatory exertion of propolis has been reviewed by Almeida and Menezes. Propolis has inhibitory goods on myeloperoxidase exertion, NADPH oxidase ornithine decarboxylase, tyrosine- protein- kinase, and hyaluronidase from guinea gormandizer mast cells. Thisanti inflammatory exertion can be explained by the presence of active flavonoids and cinnamic acid derivations. The former includes acacetin, quercetin, and naringenin; the ultimate includes caffeic acid phenyl ester (CAPE) and caffeic acid (CA) [49]. CAPE and galangin, both being typical poplar propolis ingredients, displayed anti-inflammatory exertion and significantly inhibited carrageenan oedema, carrageenan pleurisy, and adjuvant arthritis inflammations in rats [50,51]. An ethanol excerpt of propolis suppressed prostaglandin and leukotriene generation by mouse peritoneal macrophages in vitro and during zymosan convinced acute peritoneal inflammation in vivo. Salutary propolis significantly suppressed the lipoxygenase pathway of arachidonic acid metabolism during inflammation in vivo. CAPE was a more potent modulator of arachidonic acid metabolism than caffeic acid, quercetin, and naringenin [52].

Use of propolis in cosmetic formulation:
Activity of propolis in photoprotector products:
Ultraviolet (UV) light exposure may lead to colorful skin conditions, similar as unseasonable aging of the skin (wrinkling, scaling, blankness, dilatation of blood vessel, and loss of collagen) and skin cancer [53]. Propolis, due to its high antioxidant exertion, has been shown to have defensive and preventative characteristics, which places products containing propolis in the cosmeceutical class, with possible use in marketable phrasings for sun protection. The main ingredients of propolis, as handied over, are polyphenols and flavonoids. Polyphenols are promising because they're characterized by an immersion diapason that can filter UV radiations so reducing the penetration of the radiations into the skin and accordingly lowering inflammation, oxidative stress, and DNA dangerous effect [54]. Flavonoids are able of absorbing UV shafts, which underscores the possibility of its operation as a sunscreen in photoprotectors. Two intriguing studies have addressed the photoprotection eventuality of propolis. [55] estimated two types of propolis (green and red) for their photoprotective action (Fig. 1). Both green and red propolis absorbed light in the UV region, with the green propolis having advanced values of immersion in the UV region than the red propolis. The lesser degree of implicit photoprotection in the green propolis in comparison to the red propolis may be related to its chemical composition, fauna and foliage of the region, chemical commerce between the factory metabolites, and the chemical ingredients of the expression employed in the study used the ethanolic excerpt of raw propolis samples coming from the Veneto region, Italy. These authors measured the content of polyphenols, the antioxidant exertion (as lipid peroxidation), as well as the sun protection factor a specific propolis expression. The ultimate exertion was measured as recommended by the Food and Drug Administration, using an in vitro model and a CIBA sunscreen simulator — their methodology is explained in detail in their paper. The samples tested redounded in good protection to ultraviolet radiation (UVR), which was advanced than the UVR pollutants available in the skincare request. It should be noted that synthetic sunscreens tend to have too important TiO2, which can induce dangerous free revolutionaries. Propolis, on the other hand, not only doesn't induce free revolutionaries but rather can control their situations, by its antioxidant exertion. Taken together, the studies suggest that propolis and its factors, due to its UVR protection and antioxidant exertion, may be view as a cosmeceutical, and will presumably be decreasingly more used in cosmetics.

Use of propolis in acne:
Propolis can be used to treat acne due to its antimicrobial, anti-inflammatory, and mending parcels. As a result of the increased resistance of bacteria to antibodies, the use of natural products has come an volition for topical treatment of colorful pathologies similar as bacterial acne. According to, the tinge of propolis was suitable to inhibit microbial growth. Propolis resin, for illustration, set up in shops visited by notions in the region of Ponta Grossa (Paraná, Brazil) is constituted of essential canvases with flavonoids. also, composites similar as caffeic acid, phenolic ester of caffeic acid, quercetin, and naringenin act as suppressors of prostaglandins, leukotrienes, and inhibit the generation of nitric oxide; they also remove free revolutionaries generated by the neutrophils responsible for the antioxidant exertion, reducing inflammation tinge of propolis 20% from Rosmarinus officinalis was used in different attention in the ultimate work, and some of themshowed antibacterial exe tion againstP. acneus using the macrodilution system. The minimal inhibitory attention was0.625. Due to propolis present cicatrizing exertion, the use of propolis in ornamental phrasings for topical treatment has been suggested. studied the phenolic composites and their implicit in remedy of skin diseases. This work showed that due to their natural origin and low toxin, phenolic composites are a promising tool in barring the cause and goods of skin aging, skin conditions, and skin damage. Polyphenols also act protectively and help help or devaluate the progression of certain skin diseases like wrinkles and acne or serious, potentially life hanging conditions similar as cancer.

Use of propolis in lipstick:
In line with the use of further natural products rather than chemical bones, tested a camo expression using propolis. These authors estimated the effect on the rheological and texture parcels of this ornamental without using synthetic composites, preservatives, spices, and colorings. The texture analysis indicated that powders with propolis at 10 g/kg are more fragile and prone to crumbling. There was no change in rheological geste; it was viscoelastic before and after the addition of propolis. still, a temperature increase (30°C) didn't beget significant changes in their textures.However, it If propolis is used as an component in the composition of acosmetic, may make a difference in the quality and purpose of use of these products, which can now be directed to out-of-door conditioning, sports, as well as tropical countries, where regular temperatures are formerly high. really, cosmetics are an important profitable area, and currently numerous costumers look for high quality in this kind of products.

Conclusion:
Propolis is having a composition further than 300 phyto compounds. These composites are collected from different leguminous shops by canvases, and inclusively nominated as propolis. shops contain thousands of ingredients and are precious sources of new and biologically active motes enjoying antimicrobial property. Thousands of phytochemicals which have inhibitory goods on all types of microorganisms in vitro should be subordinated in vivo testing to estimate the efficacity in controlling the prevalence of complaint in crops, shops, and humans. Propolis proven the stylish antimicrobial agent world extensively by different scientists. In India propolis is in its aborning stages. Effective collaborations with pharmacists and medical croakers, factory pathologists and microbiologists are pivotal to see the complete development of an intriguing lead emulsion into and exploitable product. Its need of hour to explore Indian propolis and its antimicrobial possibilities to be a good antimicrobial/ antifungal agent.

References:


43. Duta KFD, Consolaro MEL, Svidzinski TIE & Bruschi ML, Antifungal Activity of Brazilian propolis microparticles against yeasts isolated from vulvovaginal candidiasis, Evid-based compl alt med. 2010;7-8.
44. Monti M, Benti E, Carminanti G & Cusinim, Occupational and cosmetic dermatitis from propolis, Contact Dermatitis, 1983;9:163.