

CHEMICAL COMPOSITION AND MEDICINAL PROPERTIES OF PROPOLIS

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Annotation: This article discusses the origin, chemical composition and medicinal properties of propolis. The complex structure, biologically active components and pharmacological significance of this substance produced by bees were analyzed based on scientific sources.

Keywords: propolis, bee glue, flavonoids, polyphenols, medicinal properties.

Propolis (from the ancient Greek *prasilis* - "suburb") is a brown to dark green resinous substance produced by bees, used mainly to protect the hive, disinfect cells and isolate foreign bodies [1]. After honey, propolis is the second most important product of bees. There is no single opinion on its chemical composition and origin.

Origin of propolis

There are several theories about the origin of propolis:

1. Theory of origin from resins. Propolis is based on resins collected from the bark and buds of trees (birch, poplar, willow, etc.) [2].
2. Theory of formation from pollen. Propolis is formed during the processing of flower pollen collected by bees.
3. Theory of external plant product. There was a view that propolis is not produced by bees, but by the transformation of plant products, but this has not been scientifically proven.

According to the prevailing opinion in the 21st century, the composition of propolis is variable, and there are different types of propolis depending on its botanical origin [3].

Appearance and physical properties. Propolis resembles soft plasticine, which hardens over time into a brittle mass. Its main physical properties are as follows: It melts at 80–104 °C, hardens at 15 °C; It is well soluble in alcohols such as ethanol and methanol; It retains its medicinal properties during storage [4].

One colony of bees produces an average of 30–80 g of propolis during the season, which makes the product valuable.

Chemical composition. Propolis has a complex chemical composition, and more than 200 biologically active components have been identified [5]. Average composition: 50% resinous components (flavonoids, aromatic acids, esters).

30% wax (fatty acids, alcohols);

10% essential oils;

5% pollen (amino acids and proteins);

5% other substances (minerals, vitamins, steroids).

Propolis contains trace elements such as magnesium, potassium, iron, zinc, cobalt, as well as vitamins of groups A, C, E and B. Among the amino acids, arginine, threonine, tryptophan and phenylalanine are important for humans [6].

Flavonoids (apigenin, acacetin, kaempferol) have anti-inflammatory and antimicrobial effects [7].

Medicinal and pharmacological properties

Propolis has long been used as a natural medicine. Modern research has identified the following properties:

Antibacterial and antiviral - fights infections;

Antifungal - effective against fungi;

Antiseptic - cleans and disinfects wounds;

Anti-inflammatory - reduces inflammation in the body;

Immunostimulant - strengthens the immune system;

Wound healing - accelerates the regeneration process [8].

Propolis tinctures, when used in combination with antibiotics, increase their effectiveness and do not harm the intestinal microflora [9]. Propolis is a unique biologically active substance produced by bees, which contains flavonoids, vitamins, minerals and amino acids. As a natural "antibiotic", it is widely used in folk medicine and modern medicine, characterized by antimicrobial, antifungal, anti-inflammatory and immunostimulating properties.

References

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