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How the Bee Products Are Essential

Beekeeping in India is mainly reared for honey. However, with the progress research and development in apiculture, the other valuable bee-hive products such as royal jelly, beeswax, bee venom, pollen and propolis have become known to apiculturist .

Royal jelly

Royal jelly is milky or light pale. It is composed of proteins 15-18 %, lipids 2-6%, carbohydrates 9-10% and minerals 0.7-1.2%., and it contains 65-70 % moistures. The proteins are mainly amino acids and essential amino acids including others viz. alanine, arginine, aspartic acids, glutamic acids, glycine, isoleucine, lysine, methionine, phenyl alanine, tryptophan, tyrosine and serine are present in royal jelly. Carbohydrates in royal jelly are glucose, fructose, melibiose, trehalose, maltose and sucrose. It also contains vitamin A, B and C. Mineral elements present are iron, copper, silicon and sulphur. Royal jelly also contains some other chemical stimulants which are responsible for queen determination. Royal jelly is secreted in hypopharyngeal glands by nurse-bees of 1 to 2 week age. It is very nutritious food and is fed to young workers and queen larva.

Uses: Royal jelly is very nutritious for humans' beings, as it increases vigour and vitality.

Beeswax

Beeswax is complex substance having complex esters of monatomic alcohols and fatty acids from 70.4 to 74.7% of wax; other compounds are free acids 13.5 to 15.0% and saturated hydrocarbons 12.5 to 15.5%. Its specific gravity is 0.95 and melting point is 65°C. This is secreted as liquid but solidifies when exposed to air and scales are formed. These scales are removed by hive-bees and used for comb building. Wax scales are normally white but color of wax is influenced by pigments of pollen. Beeswax is obtained from the capping collected during honey extraction, and from damaged and abandoned comb. In India, major portion of wax comes from **dorsata** comb. There are different methods of collecting wax. Generally unused comb or washed capping can be boiled in water-bath at 65°C and collected fluid is strained through the muslin-cloth or

strainer and dipped in cold water. The wax block is obtained after solidification at the top of water.

Uses:

Beeswax mainly required by candle industry and beekeeping industry for preparing comb- foundation sheets. Wax is also important constituent of cosmetics like cold cream, lipsticks and rouges. Pharmaceuticals and perfume industries are also major users of wax. It is also used in ointments, capsules, pills coating and deodorants. wax is also utilized for preparing shoe-polish and varnishes.

Honey

Honey is whole food , containing sugar, acid, minerals, vitamins, enzymes and antibiotics, present in small track. Honey contains many types of sugars but it chiefly has two reducing sugars; dextrose (glucose) and levulose (fructose) ; and these account for almost 70 % of the total solids. Sucrose in honey varies between 0 to 5 %. Minerals composition of honey is very broad comprising potassium, calcium, phosphorus sodium, magnesium, copper, sulphur, silicon and iron and all these account for 1 % solids in honey. The acids in honey are tartaric, citric, malic, succinic and amino acids and found in traces are cysteine, aspergine, lysine, glycine, aspartic acids ,glutamic alanine, tyroxine, valine , methionine, leucine etc. enzymes present in honey are invertase for conversion of sucrose to simple sugars, diastase for conversion of starch to dextrin; calalase decomposes hydrogen-peroxide, hosphatase for decomposing glycerohosphate. Different vitamins present in honey are thiamine (B₁), riboflavin (B₂), nicotine acid, vitamin K, folic acids, biotin, pyridoxine and ascorbic acid. The pigments present are carotene, chlorophyll and xanthophylls are responsible for coloration of honey. honey is hygroscopic which means it absorbs moistures from air and atmosphere . Moisture in honey is equilibrium to particular relative humidity level, for example 21.3% moisture in honey is in equilibrium with 66% relative humidity. Honey containing higher moisture content tends to ferment at 11°- 21° C and the tendency is reduced at lower or higher temperature. Fermented honey is sour in taste because of the acidity, which is high as 1.5-3.1 milli equivalents. Heating honey to 64°C in water bath for about 30 minute destroys yeast in honey and thus fermentation is prevented. Pure honey should have specific gravity between 1.35 and 1.44 and less than 20% moisture content.

It is sweet viscous fluid produced by honeybees mainly from the nectar of the flowers. The quality of honey varies from plant to plant depending upon the physicochemical properties of the nectar. On this basis, the honey can be classified as a floral honey or honeydew honey. Though monofloral honey is not common in India, yet honey can be categorized on the basis of floral sources such as mustard honey, litchi honey, berseem honey eucalyptus honey etc. Honey is extracted and prepared for market by different methods. The honey from *Apis dorsata* comb is squeezed manually, and it contains pollen-grains and even juice of some brood and is a crude honey, known as squeezed honey. The honey from bee –hive extracted from combs with the help of honey extractor

is known as hive-honey. This honey may remain in liquid or crystallize, and hence can be presented to consume as liquid honey or granulated honey.

Uses:

Honey provides energy with high calories in a readily available form and helps building hemoglobin. It forms an ideal health drink with tea, coffee and lemon. Honey is used as a carrier for all ayurvedic and unani medicine. Honey is a good laxative, blood purifier, preventive against cough and cold and relieves sore throat. It is a remedy for tongue ulcers. Its regular use is recommended in severe cases of malnutrition with impaired digestion, stomach and intestinal ulcers.

Propolis

It is collected by bees from resinous exudates of trees. In a bee colony, propolis is used by bees for sticking frames, sealing cracks and crevices. Propolis is mainly composed of resins and balsams 55 %, ethanol and aromatic oils 10 % and pollen 5 %. Propolis is obtained by scraping it from frames. It is used as an adhesive and has the quality of healing wounds, preparing ointments for treating cuts, wounds and abscesses in cattle. Mixed with Vaseline, it heals burns.

Bee-venom

The sting apparatus of the worker bees is attached to a poison-sac where venom is stored. Normally, a 2-week-old worker bee can secrete maximum venom in her sac. Bee venom is mainly used by bees as a defense mechanism. The composition of bee venom is complex and is composed of many active chemicals such as histamine, apamine, acitthinase, hydrochloric acid, formic acid, orthophosphoric acid, sulphur, calcium, copper and magnesium sulphate.

Production :

The commercial method of obtaining bee venom is by electric shock. Thin copper wires are attached about 1 cm apart on a wooden frame which is alternatively charged. The wire devices are inserted between the bottom board and brood chamber and electric current passes through wires at 12-15 volts. The bees get shocked when they come in contact with the electric wire and get irritated. They release venom by inserting their stings into a thin nylon cloth below the copper wires. Venom is deposited on a glass plate placed below the nylon sheet. The venom on drying is scraped from the glass plate.

Uses:

Bee venom has been reported useful for curing many human diseases and disorders. Rheumatism cannot be cured by any other system of medical treatment but can be cured through bee venom injection to patients. Bee-venom is also useful in curing necrosis, endoarthritis and neuralgia. It has a stimulating effect on heart muscles and stinging decreases cholesterol levels and also lowers blood pressure. The treatment through bee venom is now a day's getting popularity, and it is known as apitherapy. Some

people may show allergic reaction to bee venom and bee sting may have general indisposition, vomiting, swelling and diarrhea but repeated stinging at intervals makes them immune. Honey is used as a healing touch. Proteins antigens of bee cause hypersensitivity. Antihistamine cream or injection and adrenaline are used as antiallergents.

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