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A review on the composition and properties of Dragée Royal Jelly (DRJ)

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Abstract

Royal jelly is an important functional food item that possesses several health-promoting properties. Royal jelly is a viscous jelly substance and milky secretion contains 62 to 68.5% water, 11 to 18% protein, 7 to 18% sugar, 2 to 8% fat, and at least 1.4% 10-hydroxy2 - Decenoic fatty acid and less than one percent of vitamins and minerals. The health-promoting properties of Royal Jelly include; Immunomodulatory and Anti-inflammatory Activities, Increases fertility and sexual vitality, Reducing the side effects of chemotherapy and radiation therapy and improving the quality of life of certain patients, Improving memory, and Reducing the risk of dementia and Alzheimer's disease, Anti-diabetic, Regulates blood pressure and prevents cardiovascular disease, Reduces the damaging effects of Rheumatoid Arthritis and Antibacterial and Antiviral Activities.It's recommended that sublingual absorption can be more efficient overall for Royal Jelly than intestinal uptake. The storage condition (4 or -18°C) and Royal jelly dosage are critical. On the other hand, taking Royal Jelly, especially in the overdose, may lead to an allergic reaction. Since the specific gravity, moisture, and storage condition of Royal Jelly are different from honey, in a mixture of honey and royal jelly, Royal Jelly is exposed to oxygen, then spoilage occurs. For this reason, this method of use, a mixture of honey and royal jelly, is not recommended. Also, the use of Royal Jelly in the form of capsules, due to swallowing and lack of oral absorption, is not recommended.The research and development unit of the Kooze Asal knowledge-based Company, with new knowledge in Pure Persian Royal Jelly processing, has been able to develop a domestic production technology of Dragée Royal Jelly (DRJ) by international standards. Freeze-dried royal jelly goes through a process of dehydration, also known as lyophilizing, to remove the water by high vacuum at low temperature. This process does not include heat or chemicals. Lyophilized royal jelly in DRJ maintains all the nutrients of the fresh product and allows for storage at room temperature and longer shelf life. Pure Persian royal jelly is harvested from Kooze-Asal beehives, depending on the quality charter of the Association of Producers of Royal Jelly. Sucking/Chewy Dragée, named DRJ is composed of freeze-dried royal jelly and honey with natural coating and contains no additives, dyes, or added sugars. In this article, we review the research of recent years on the unique properties of this supplement for a healthy lifestyle called dragee royal jelly (DRJ).

Key words: Royal Jelly, Sucking/Chewy Dragée, healthy lifestyle

Royal jelly is an important functional food item that possess several health promoting properties.

Royal jelly is a viscous jelly substance and milky secretion from the hypopharyngeal and mandibular glands of young worker bees and is used to feed the bee larvae up to three days. Its odor is pungent, the taste being sour and sweet. The queen honeybee is fed Royal jelly throughout all life, and this is the reason for the longevity, larger body and extraordinary fertility of the queen bee [1].

The composition of Royal jelly is quite complex. It contains different carbohydrates, proteins, amino acids, fatty acids, minerals, trace

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elements, vitamins, organic antibiotic and acetylcholine, which possess several health promoting properties. Royal jelly is an important functional food item that possesses several health-promoting properties. Royal jelly contains 62 to 68.5% water, 11 to 18% protein, 7 to 18% sugar, 2 to 8% fat, and at least 1.4% 10-hydroxy2 - Decenoic fatty acid and less than one percent of vitamins and minerals. [1].

The unique feature of Royal jelly is 10-hydroxy-2-decenoic acid (10-HAD), which is believed to be present only in Royal jelly, is known for having various pharmacological effects.

Methods of use of Royal jelly

Royal Jelly has been traditionally used since Ancient Iran because it was favored by physical and mental capabilities, and was a symbol of longevity and fertility. Royal jelly is used fresh, mixed with honey or other bee products such as pollen and propolis, in capsules or syrups.

It's recommended that sublingual absorption can be more efficient overall for Royal Jelly than intestinal uptake. The storage condition (4 or -18°C) and Royal jelly dosage are critical. On the other hand, taking Royal Jelly, especially in the overdose, may lead to an allergic reaction. Since the specific gravity, moisture and storage condition of Royal Jelly are different from honey, in a mixture of honey and royal jelly, Royal Jelly is exposed to oxygen, then spoilage occurs. For this reason, this method of use, mixture of honey and royal jelly, is not recommended. Also, use of Royal Jelly in the form of capsules, due to swallowing and lack of oral absorption, is not recommended.

A new technology for production of Dragée Royal Jelly (DRJ)

Freeze-dried royal jelly goes through a process of dehydration, also known as lyophilizing, to remove the water by high vacuum at low temperature. This process does not include heat or chemicals. Lyophilized royal jelly in DRJ maintains all the nutrients of the fresh product and allows for storage at room temperature and a longer shelf life. DRJ like royal jelly is a good supplement for the hectic and stressful lifestyles for men and women. Packed with essential proteins, vitamins, minerals, amino acids, fatty acids, and a special bio-active compound called 10-hydroxy-2-decenoic acid (10-HDA), now in an easy to take dragees form.

Pure Persian royal jelly is harvested from Kooze-Asal beehives, depending on the quality charter of the Association of Producers of Royal Jelly.

Sucking/Chewy Dragée, named DRJ is composed of freeze-dried royal jelly and honey with natural coating, and contains no additives, dyes or added sugars.

Determination of 10-HDA by High-performance liquid chromatography (HPLC)

10-HAD %	0 - 1.3	1.4 – 1.6	1.7 - 2	2.1 - 3	≥ 3.1
Royal Jelly quality	Unacceptable	Weak	Good	Very Good*	Excellent*

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* Royal Jelly quality used in Kooze Asal knowlege-based Company

Health Promoting Properties of Dragée Royal Jelly

- Immunomodulatory and Anti-inflammatory Activities

Dragée Royal Jelly, especially 10-Hydroxy-2-decenoic acid (10-HDA; “royal jelly acid”), is taken into consideration numerous biological properties and several pharmacological activities such as, antibiotic, anti-inflammatory, immunomodulatory and anti-allergic. Studies showed that royal jelly exhibited immune stimulatory effects by enhancing antibody production and proliferation of immunocompetent cells [2].

- Increases fertility and sexual vitality

Infertility is a fairly common world problem, which unfortunately, today's lifestyle has increased this problem. Several unhealthy facets such as lack of physical activity, stress, smoking, diabetes, obesity and polycystic ovary syndrome, have negative effects on the fertility of male and female. Scientific and traditional findings are proven Royal Jelly is the therapeutic and act as a food supplements that can be used it in to improve fertility and sexual vitality in men and women. Royal Jelly Dragée increases egg quality, sperm count and motility and can balance sex hormones [3] [4].

- Reduces the side effects of chemotherapy and radiation therapy and improve the quality of life of improve the quality of life of certain patients

Many researchers have reported the prophylactic use of royal jelly for side effects of chemotherapy and radiation therapy in cancer patients. Royal Jelly Dragée can help improve the quality of life and relieve fatigue and weakness in certain patients, including cancer patients.

A study demonstrated that prophylactic use of Royal Jelly was effective in reducing mucositis induced by chemo-radiotherapy in head and neck cancer patients [5]. Also, in children who have malign diseases such as acute leukemia, lymphoma and hepatoblastoma, consumption of Royal Jelly for one month, increases the average white blood cells, neutrophils and lymphocytes. The general conditions (having an appetite and feeling better) increased and weight gain were observed after Royal Jelly administrations [6].

- Improves memory and Reduces risk of dementia and Alzheimer's disease

Alzheimer’s disease is a widespread, age-related, multifactorial neurodegenerative disease that has enormous social and financial drawbacks worldwide. Preclinical findings revealed that Royal Jelly acts as a multidomain cognitive enhancer that can restore cognitive performance in aged and Alzheimer's disease people. Royal Jelly compounds such as acetylcholine, promote brain cell survival and function by targeting multiple adversities in the neuronal microenvironment such as inflammation, oxidative stress and bioenergetic challenges [7].

- Anti-diabetic

It has been demonstrated that Royal Jelly has antioxidant properties and can impact oxidative stress and glycemic control via insulin-like peptides and other compounds. On the basis of researches, it appears that Royal Jelly supplementation be beneficial in controlling diabetes outcomes [8].

- Regulates blood pressure and prevents cardiovascular disease

Royal Jelly acts on the cardio-vascular system and on the blood as a blood pressure regulator, it stimulates and invigorates the organism. Studies suggest that the 10-HDA from Royal Jelly may be responsible for the anti-hypertensive action. Also, in a study intervention with Royal Jelly for three months considerably lowered the triglyceride and low-density lipoprotein cholesterol (LDL-c) levels and thus alleviates the risk of cardiovascular disease [9].

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- Reduces the damaging effects of Rheumatoid Arthritis

Rheumatoid arthritis is a chronic inflammatory disease. 10-HDA has been reported to have much pharmacological effect which able to block p38 kinase and c-Jun N-terminal kinase–AP-1 signaling pathways. Therefore, Royal Jelly may be of potential therapeutic value in inhibiting joint destruction in Rheumatoid arthritis [10].

- Hematopoietic, energizing and anti-fatigue

Dragée Royal Jelly contains B vitamins; therefore, it promotes hematopoietic and energizing. In Chinese and Japanese medicine recommend Royal Jelly in anemia (a 2-3 weeks treatment significantly improves the number and quality of the red blood cells) [11]. Dragée Royal Jelly can increase physical strength and reduce fatigue in athletes and soldiers.

- Antibacterial and Antiviral Activities

Royalisin, an antimicrobial protein, and several fatty acids from Royal Jelly, active against a large spectrum of bacteria, viruses and fungi. Thus Dragée Royal Jelly is a natural antibiotic [12].

- Reduces menopausal symptoms

Menopause is associated with physical and emotional discomfort for women and has major negative effects on their quality of life. Dragée Royal Jelly is effective in reducing the symptoms of premenstrual syndrome and also prevents bone loss in osteoporosis. These pharmacological effects of royal jelly are similar to those caused by the hormone estrogen [13].

- Develops strong bones, teeth and cartilage

Dicalcium phosphate used in Dragée Royal Jelly formula, is effective for the prevention and treatment of Phosphorus and Calcium Deficiency Diseases such as; Osteoporosis, Hypoparathyroidism, joint pain and Rheumatoid Arthritis, and is needed for keeping bones, teeth and cartilage healthy [14].

How to use Dragée Royal Jelly?

It's recommended that you take as sucking or chewing Dragée Royal Jelly, and sublingual absorption can be more efficient overall for Royal Jelly than intestinal uptake. For adults, daily consumption of one dragée is recommended. We also recommend drinking a glass of water after consuming.

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