



## Peptides and Proteins in Royal Jelly

Wadhwa Renu<sup>1\*</sup>, Wensheng Zhang<sup>2</sup>

<sup>1</sup>Department of General Surgery, University of Kota, Rajasthan, India

<sup>2</sup>Beijing Key Laboratory of Protection and Utilization of Chinese Medicine, Beijing Normal University, Beijing, People's Republic of China

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### Description

Royal jelly, a honey bee secretion, plays an important role in caste determination in honey bees because it serves as the source of nutrition for young larvae destined to become queens. It is also fed to adult queens. Royal jelly possesses various functional properties and has been used as a medication, health food, and cosmetic in many countries. Royal jelly is 67% water, 12.5% protein, 11% monosaccharides, 6% fatty acids and 3.5% 10-hydroxy-2-decenoic acid (10-HDA). It consists of trace materials antibacterial and antibiotic component, and also some trace of vitamin like A,D,E.

### Major Royal Jelly Proteins (MRJPs)

**The family of proteins secreted by honey bee:** The family consists of nine proteins, they are MRJP1 also called royalactin, MRJP2, MRJP3, MRJP4, and MRJP5 are present in the royal jelly secreted by worker bees. MRJP1 is the most present in largest in volume. The five proteins constitute 82%-90% of the total proteins in a royal jelly. Royal jelly is rich in a nutrient-rich mixture of vitamins, sugars, fats, proteins and also enzymes. It is used for feeding the larvae. Royal jelly has been used in traditional medicine since ancient period, and the MRJPs are shown to be the main medicinal components. They are synthesised by a family of nine genes, which are in turn members of the yellow family of genes such as in the fruitful and bacteria. They are contribution to be involved in various development of queen larva and worker larvae, thus produces division of labour in the bee colony.

### Peptides in royal jelly

Peptides isolated from natural fonts are the object of different studies the main objective is to searching new molecules possessing antibacterial activity. The studies on peptides originally isolated from the Royal Jelly, We found that jelleins are mainly productive against gram-positive bacteria the jelleins and on some analogs having a UV reporter at the N- or C-terminus. Therefore, they act in synergy with peptides belonging to the family of temporins such as temporin A and temporin B against *Staphylococcus aureus* A170 and *Listeria monocytogenes*.

The hypopharyngeal gland (hpg) and the Mandibular gland (mbg) are the organs involved in the production of RJ. Mbg is a pair of sac like glands which is found only in queen and worker bee. It is located on both sides of the head, directly above the mandibles. Similar to HPG, RJ secretion by MBG also changes with age of worker bees. Hpg is a paired long tuberosus organ located within the frontal part of the worker bee's head. It has many small sacs like structures called acini composed of secretory cells. The genes in these secretory cells temporally express a variety of proteins that regulate age (time) dependent changes in honey bees. These proteins are regulated by phosphorylation to optimize their cellular activity. The size of the acini increases around the 6<sup>th</sup> day after hatching coinciding with the very high rate of expression of RJ but is significantly reduced after the 15<sup>th</sup> day with the colour changing from cream to pale yellow.