

# “EFEK IMUNOMODULATOR MADU (*HONEY BEE*) DAN *ROYAL JELLY* TERHADAP SISTEM IMUN KASUS COVID-19”

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## Abstrak

COVID-19 menyebabkan jutaan kasus dan ribuan kematian di dunia. Penularan infeksi SARS-CoV-2 menyebabkan gejala klinis bervariasi. COVID-19 berkaitan erat dengan imunitas tubuh yang memiliki keterlibatan peran pengobatan terutama menggunakan tanaman herbal. Penelitian pengobatan alternatif sebelumnya membuktikan efektivitas produk madu dan *royal jelly* yang banyak habitatnya berasal dari lebah hutan alam Indonesia. Produk lebah madu membuktikan respon sistem imun protektif dari senyawa flavonoid sebagai antivirus dan imunomodulasi kandungan *royal jelly* MRJP dan 10-HDA. Keduanya dibuktikan dengan data akurat secara komprehensif dimana memiliki efek sama dalam imunomodulator dalam kasus COVID-19. **Metode:** *Systematic Literature Review* dengan strategi pencarian literatur menggunakan PubMed, *Google Scholar*, ProQuest, dan *Science Direct*. Literatur yang digunakan membahas tentang Madu (*Honey Bee*), *Royal Jelly*, efek imunomodulator dan sistem imun. **Hasil:** 7 artikel penelitian menggambarkan bukti madu dan *royal jelly* sebagai efek imunomodulator pada sistem imun kasus COVID-19 dalam kategori sedang, kuat, dan sangat kuat. **Kesimpulan:** Madu dan *royal jelly* berpotensi memberikan efek imunomodulator karena kandungan pada madu adalah *flavonoid* sedangkan pada *royal jelly* adalah *MRJPs* dan *10-HDA* terdapat respon antibodi Ig-G dan Ig-M pada sel humoral sedangkan sel selular berupa presentasi sel T limfosit, makrofag, neutrofil serta mediator inflamasi berupa sitokin TNF, IL-1, IL-6 dan IL-4 serta sel NK.

**Kata kunci:** *Efek imunomodulator, Madu, Royal Jelly*

# **“EFFECTS OF HONEY (*HONEY BEE*) AND ROYAL JELLY AS IMUNOMODULATOR ON THE IMMUNE SYSTEM COVID-19 CASES”**

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## ***Abstract***

*COVID-19 causes millions of cases and thousands of deaths worldwide. Transmission of SARS-CoV-2 infection causes varied clinical symptoms. COVID-19 is closely related to the body's immunity which has an involved role in treatment, especially using herbal plants. Previous research on alternative medicine has proven the effectiveness of honey and royal jelly products, many of which come from Indonesian natural forest bees. Honey bee products prove a protective immune system response from flavonoid compounds as antiviral and immunomodulators containing royal jelly MRJP and 10-HDA. Both are proven by comprehensively accurate data which have the same effect on immunomodulators in cases of COVID-19. **Method:** Systematic Literature Review with literature search strategy using PubMed, Google Scholar, ProQuest, and Science Direct. The literature used discusses Honey (Honey Bee), Royal Jelly, immunomodulatory effects and the immune system. **Results:** 7 research articles described evidence of honey and royal jelly as immunomodulatory effects on the immune system of COVID-19 cases in the moderate, strong, and very strong categories. **Conclusion:** Honey and royal jelly have the potential to provide an immunomodulatory effect because honey contains flavonoids while in royal jelly is MRJPs and 10-HDA there is an Ig-G and Ig-M antibody response in humoral cells while cellular cells are T cell presentation of lymphocytes, macrophages, neutrophils and inflammatory mediators such as cytokines IL-4, IL-1, IL-6 and TNF and NK cells.*

**Keywords:** *Immunomodulatory effects, Honey, Royal Jelly*