

**EFEKTIVITAS MADU GALO-GALO (*Trigona* sp.) DALAM MENANGKAL
PENURUNAN TINGKAT KECERDASAN MENCIT AKIBAT PEMBERIAN
MONOSODIUM GLUTAMAT**

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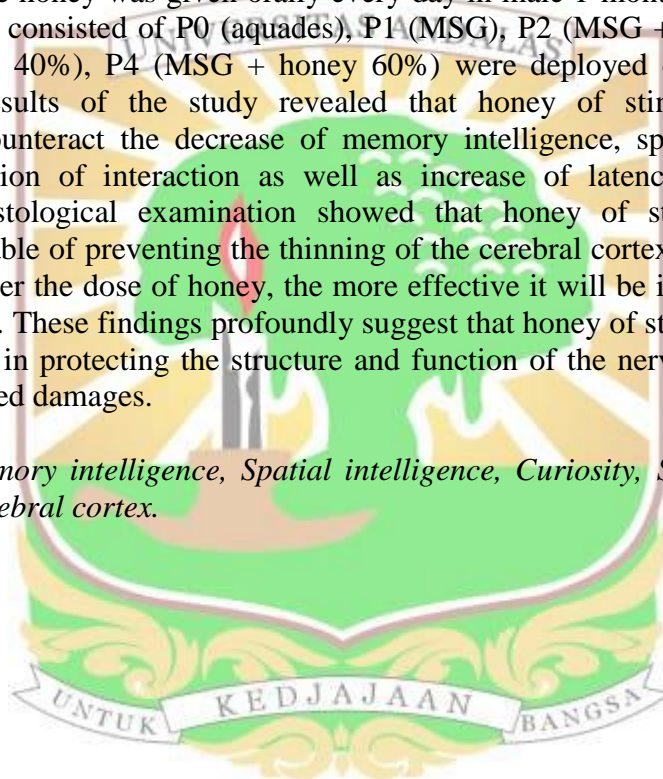
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ABSTRACT

Monosodium Glutamate (MSG) is known to be capable of causing neurotoxic effects which result in decreased intelligence both in animal models and humans. Otherwise, the sugar content of honey could nourish the neurons while the antioxidants could counteract the free radicals. Both sugar and antioxidants are found in honey of stingless bee (*Trigona* sp.). The purpose of this study was to clarify that honey of stingless bee could prevent a decrease in the intelligence and thinning of the cerebral cortex of mice due to consumption of MSG. This research was conducted from December 2018 to March 2019 in the Laboratory of Animal Physiology and the Structure of Animal Development. MSG is mixed with drinking waters and provided ad libitum while honey was given orally every day in male 1-month-old DDY mice. Five treatments consisted of P0 (aquades), P1 (MSG), P2 (MSG + honey 20%), P3 (MSG + honey 40%), P4 (MSG + honey 60%) were deployed continuously for 4 weeks. The results of the study revealed that honey of stingless bee could significantly counteract the decrease of memory intelligence, spatial intelligence, curiosity, duration of interaction as well as increase of latency time of social interaction. Histological examination showed that honey of stingless bee was effectively capable of preventing the thinning of the cerebral cortex in mice fed with MSG. The higher the dose of honey, the more effective it will be in neutralizing the impact of MSG. These findings profoundly suggest that honey of stingless bee exerts a high efficacy in protecting the structure and function of the nervous system from the MSG-induced damages.

Keywords: *Memory intelligence, Spatial intelligence, Curiosity, Social Interaction Cerebral cortex.*



ABSTRAK

Monosodium Glutamat (MSG) diketahui mampu menimbulkan efek neurotoksik yang mengakibatkan penurunan kecerdasan pada hewan model dan manusia. Sebaliknya, kandungan gula pada madu dapat menutrisi otak, sementara antioksidan mampu menangkal radikal bebas. Keduanya, gula dan antioksidan ditemukan dalam madu galo-galo (*Trigona* sp.). Tujuan dari penelitian ini adalah untuk membuktikan bahwa madu galo-galo mampu mencegah penurunan kecerdasan mencit dan penipisan korteks serebrum mencit akibat konsumsi MSG. Penelitian ini dilaksanakan sejak Desember 2018 sampai Maret 2019 di Laboratorium Fisiologi Hewan dan Struktur Perkembangan Hewan. MSG dicampurkan ke dalam minuman dan diberikan secara ad libitum, sedangkan madu disonde secara oral setiap hari pada mencit DDY jantan berusia 1 bulan. Lima perlakuan yang terdiri atas P0 (akuades), P1 (MSG), P2 (MSG + madu 20%), P3 (MSG + madu 40%), P4 (MSG + madu 60%) dilakukan selama 4 minggu. Hasil penelitian menunjukkan bahwa asupan madu galo-galo secara signifikan dapat menangkal penurunan kecerdasan memori, kecerdasan spasial, keingintahuan, durasi interaksi dan peningkatan waktu latensi interaksi sosial. Pemeriksaan histologis memperlihatkan bahwa madu galo-galo mampu mencegah penipisan lapisan korteks serebrum mencit yang mengkonsumsi MSG. Semakin tinggi dosis madu, semakin optimum efektivitasnya dalam menetralkan dampak MSG. Temuan ini menunjukkan bahwa madu galo-galo memiliki khasiat yang tinggi dalam melindungi struktur dan fungsi sistem saraf dari kerusakan yang disebabkan oleh MSG.

Kata kunci: *Kecerdasan memori, Kecerdasan spasial, Keingintahuan, Interaksi sosial, Korteks serebrum.*

