

PENGARUH PERUBAHAN MUSIM TERHADAP KUALITAS MADU LEBAH KLANCENG (*Tetragonula laeviceps* Smith, 1857) DI KEBUN PENELITIAN SAWITSARI FAKULTAS BIOLOGI UGM

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INTISARI

Indonesia merupakan negara beriklim tropis, sehingga perubahan kondisi musim dapat berpotensi memengaruhi aktivitas organisme, khususnya serangga penyerbuk seperti lebah klanceng (*Tetragonula laeviceps*). Penelitian ini bertujuan untuk menganalisis pengaruh musim terhadap madu lebah klanceng, membandingkan komposisi madunya pada musim kemarau dan penghujan, serta menganalisis hubungan perubahan komposisi senyawa volatil dengan kualitas madu yang dihasilkan pada musim berbeda. Pengambilan sampel madu *T. laeviceps* dilakukan di habitat Stasiun Penelitian Sawitsari pada periode musim kemarau dan musim penghujan. Analisis yang dilakukan meliputi pengukuran kadar air dan identifikasi profil senyawa menggunakan *Gas Chromatography-Mass Spectrometry* (GC-MS). Hasil penelitian menunjukkan bahwa rata-rata kadar air madu pada musim kemarau sebesar $27,002 \pm 0,478\%$, sedangkan pada musim penghujan mengalami peningkatan menjadi $28,667 \pm 0,084\%$. Analisis GC-MS menunjukkan bahwa pada musim kemarau, madu didominasi oleh golongan keton (seperti 2-tridecanone dan 2-pentadecanone) serta alkana (heneicosane). Sebaliknya, pada musim penghujan terjadi pergeseran dominasi senyawa menjadi golongan alkana (heptatriacontane) yang disertai dengan peningkatan persentase asam asetat secara signifikan dari 2,753% menjadi 15,226%. Perbedaan musim sangat memengaruhi karakteristik fisikokimia madu *T. laeviceps*, terutama fluktuasi kadar air yang pada akhirnya memicu perubahan pada komposisi senyawa volatil dalam madu.

kata kunci: Musim, madu, kadar air, GC-MS

THE EFFECT OF SEASONAL CHANGES ON THE QUALITY OF STINGLESS BEE HONEY (*Tetragonula laeviceps* Smith, 1857) AT THE SAWITSARI RESEARCH GARDEN, FACULTY OF BIOLOGY, UGM

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ABSTRACT

Indonesia has a tropical climate, so changes in seasonal conditions can potentially affect the activity of organisms, particularly pollinating insects such as the stingless bee (*Tetragonula laeviceps*). This study aims to analyze the effect of seasons on stingless bee honey, compare its composition during the dry and rainy seasons, and analyze the relationship between changes in volatile compound composition and the quality of honey produced in different seasons. Sampling of *T. laeviceps* honey was conducted at the Sawitsari Research Station habitat during the dry and rainy seasons. The analyses conducted included measuring moisture content and identifying compound profiles using Gas Chromatography-Mass Spectrometry (GC-MS). The results showed that the average moisture content of honey during the dry season was $27.002 \pm 0.478\%$, while during the rainy season it increased to $28.667 \pm 0.084\%$. GC-MS analysis showed that during the dry season, the honey was dominated by ketones (such as 2-tridecanone and 2-pentadecanone) and alkanes (heneicosane). Conversely, during the rainy season, there was a shift in the dominance of compounds toward the alkane group (heptatriacontane), accompanied by a significant increase in the percentage of acetic acid from 2.753% to 15.226%. Seasonal differences greatly influence the physicochemical characteristics of *T. laeviceps* honey, particularly fluctuations in moisture content, which ultimately trigger changes in the composition of volatile compounds.

Keywords: Season, honey, water content, GC-MS