

## **Identifikasi Lebah Madu (Hymenoptera: Apini) di Taman Nasional Gunung Merbabu (TNGMb) dengan Analisis Geometrik-Morfometrik dan Molekuler**

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### **INTISARI**

Lebah madu merupakan serangga eusosial dari ordo Hymenoptera dan Genus *Apis*, mereka memiliki peran penting terhadap lingkungan sekitarnya. Taman Nasional Gunung Merbabu (TNGMb) memiliki keanekaragaman hayati yang beragam dan melimpah, namun, tidak banyak ditemukan informasi penelitian terhadap keberadaan dan keanekaragaman lebah madu di TNGMb. Penelitian diawali dengan mengoleksi spesimen lebah madu di TNGMb kemudian spesiesnya akan diidentifikasi berdasarkan karakter morfologis, lalu diidentifikasi karakter geometri-morfometrinya dengan teknik analisis morfometri standar untuk mengamati karakter signifikan beserta *landmark* venasi sayapnya, dilakukan juga identifikasi molekuler berdasarkan gen *16S rRNA* dan *COI* untuk membandingkan hubungan filogeninya dengan database spesies yang sama di NCBI: GenBank, lalu sebagai tambahan, lebah madu yang hidup di dataran rendah digunakan sebagai pembanding untuk semua uji yang telah disebutkan sebelumnya. Hasil penelitian menunjukkan bahwa didapatkan satu spesies lebah madu di TNGMb yaitu *Apis cerana* yang ditemukan di 12 titik grid TNGMb, lebah madu tersebut hidup di sekitar ketinggian 790.36 - 2269.33 mdpl, dengan karakter T, HL, HW, WL, WW, MW, C sebagai pembeda dengan lebah madu sampel pembanding, didapatkan pula *landmark* venasi sayap nomor 11, 16, dan 17 yang menjadi bagian berkontribusi tinggi sebagai pembeda venasi sayap *A. cerana* dataran tinggi dan rendah, hasil analisis berdasarkan gen *16S rRNA* lebah madu TNGMb tidak memisah dengan lebah madu Kedungpoh dengan jarak genetik 0%, sementara berdasarkan gen *COI* lebah madu TNGMb Suwanti 2 memisah dengan lebah madu Kedungpoh dengan jarak genetik 0.3%. Dengan data – data tersebut penelitian ini diharapkan dapat memberikan manfaat berupa informasi database lebah madu, dan lebah di kawasan TNGMb.

**Kata kunci:** Lebah madu, Apini, Taman Nasional Gunung Merbabu, Identifikasi, Geometri-morfometri, Molekuler

## Identification of Honey Bee (Hymenoptera: Apini) in Mount Merbabu National Park (TNGMb) using Morphometric-Geometric and Molecular Analysis

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### ABSTRACT

Honey bees are eusocial insects from the order Hymenoptera and the genus *Apis*, they have an important role in their surrounding environment. Mount Merbabu National Park (TNGMb) has diverse and abundant biodiversity, however, there is not much research information on the existence and diversity of honey bees in TNGMb. The study began by collecting honey bee specimens in TNGMb then the species will be identified based on morphological characters, then the geometric-morphometric characters are identified using standard morphometric analysis techniques to observe significant characters along with wing venation landmarks, molecular identification is also carried out based on the *16S rRNA* and *COI* genes to compare their phylogenetic relationships with the same species database in NCBI: GenBank, then in addition, honey bees that live in the lowlands are used as a comparison for all the tests mentioned previously. The results of the study showed that one species of honey bee was found in TNGMb, namely *Apis cerana*, which was found at 12 grid points of TNGMb, the honey bee lives at an altitude of around 790.36 - 2269.33 masl, with the characters T, HL, HW, WL, WW, MW, C as a differentiator with the comparison honey bee sample, wing venation landmarks number 11, 16, and 17 were also obtained as the highest contribution value to differentiate wing venations of *A. cerana* in the highlands and lowlands, the results of the analysis based on the *16S rRNA* the honey bee in TNGMb does not separate with a genetic distance of 0%, however, based on *COI* genes the honey bee of TNGMb (Suwanting 2) separates from Kedungpoh with a genetic distance of 0.3%. With these data, this research is expected to provide benefits in the form of information on honey bee databases and bees in the TNGMb area.

**Keywords:** Honey bee, Apini, Mount Merbabu National Park, Identification, Morphometry-Geometry, Molecular