Abstract No: 127 ***Life Sciences***

CHARACTERISTIC WING VEIN PATTERNS OF COMMON MOSQUITO GENERA IN SRI LANKA

M.B.K.K. Bandaranayake[1], H.M.J.N. Dissanayake[1], H.M.S.S. Amarasekara[1], W.A.P.P. De Silva[2] and W.G.D. Chathuranga[1*]

[1]Department of Zoology, Faculty of Science, University of Ruhuna, Matara, Sri Lanka.
[2]Department of Zoology, Faculty of Science, University of Peradeniya, Peradeniya, Sri Lanka.
[*]chathurangawgd@zoo.ruh.ac.lk

Mosquitoes play a significant role in transmitting many devastating diseases to humans and wildlife. Proper identification is crucial in understanding mosquito epidemiology and disease transmission. Morphological taxonomic keys which are commonly employed in identification, may not be accurate in differentiating sibling species. The study investigated unique wing vein lengths and fork angles to develop a mosquito identification key. Larvae were collected from breeding sites and reared under laboratory conditions. Adult mosquitoes were collected using animal-baited traps and human landing catches. Right and left wings of 40 individual mosquitoes (females: 65%; males: 35%) representing seven common genera [*Culex* (n = 18), *Aedes* (n = 12), *Armigeres* (n = 12), *Orthopodomyia* (n = 12), *Toxorhynchites* (n = 4), *Coquilletidia* (n = 12), and *Anopheles* (n = 10)] were used for this study. Slide-mounted wings were photographed, and 21 wing vein length measurements and the folk angle were taken in pixels using a microscopic camera (CuA, MCu, MCu cross vein, M3+4, M1+2, M2, M1, R2+3 - M1+2 Cross vein half 1 & 2, R4+5, R2+3, R3, R2, 1A-CuA, CuA-M3+4, M3+4-M2, M2-M1, M1-R4+5, R4+5-R3, R3-R2, R2-R1, R2+3-M1+2). Results of the Multivariate Analysis of Variance (MANOVA) showed a significant difference in the length of selected wing veins between genera ($P < 0.001$). The Canonical Variate Analysis (CVA) suggested that the lengths of the Mcu cross vein, M1+2 vein, CuA vein, McU vein, and R2+3 are specific to each genus. The folk angle of R2+3 – M1+2 was excluded from MANOVA and CVA due to unit discrepancies. Taxonomic keys were generated based on the non-overlapping minimum and maximum values of the length of wing veins. *Toxorhynchites* were characterized by Mcu Cross Vein (range: 0.04 – 0.11 mm), while *Orthopodomyia* was distinguished with the M 1+2 vein (range: 0.86 – 0.95 mm). The identity of *Aedes* was confirmed using the CuA vein (range: 0.39 - 0.56 mm). *Armigeres* was characterized with the McU vein (range: 0.48 – 0.59 mm), while *Coquillettidia* was distinguished with the R 2+3 vein, which ranged from 0.51 – 0.67 mm. The folk angle of R 2+3 – M 1+2 can be used to separate *Culex* (118.74° – 144.63°) from *Anopheles* species (172.52° – 178.72°). These findings provide valuable and cost-effective insights into the taxonomy of common mosquito genera, while further studies are warrented to determine the applicability in identifying mosquito species/sibling-level.

Financial assistance from the University Research Grant (Grant No: RU/SF/RP/2022/21) is acknowledged.

Keywords: Dichotomous keys, Mosquito Taxonomy, Wing morphology, Wing vein patterns