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# IDENTIFICATION OF MOSQUITOES USING MORPHOMETRIC WING CHARACTERS

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**Abstract** Mosquitoes are responsible for the transmission of several infectious diseases endangering approximately 3 billion people around the world. The precise identification of mosquitoes' species is decisive to understand epidemiological patterns of diseases transmission and to develop control strategies. The most commonly method used to the identification of mosquito relies on morphological taxonomic keys. Mosquito wing geometric morphometric is able to identify vector mosquitoes, even sibling and cryptic species. The objective of the present study is to accurately identify twelve mosquito species from the three main epidemiologically important mosquito genera using wing morphometric technique. Twelve mosquito species from three epidemiological important genera (*Aedes*, *Anopheles* and *Culex*) were collected and identified by taxonomic keys. The right wing of adult female mosquitoes was removed, photographed and the coordinates of eighteen landmarks at the vein intersections were digitized. The allometric influence was accessed followed by a canonical variation analysis, a thin-plate splines, a reclassification and cross-validated test were computed for each individual and a Neighbor Joining tree was constructed to illustrate species identification and segregation. The analyses and graphics were made with the following software: TpsUtil 1.29, TpsRelw 1.39, MorphoJ 1.02, Past 2.17c. The canonical variation analysis between *Aedes*, *Anopheles* and *Culex* genera showed a clear segregation of genera, subgenera and species in the morphospace correctly sorting out mosquitoes employed in this study. The pairwise cross-validated reclassification test regarding genera resulted in at least 99% identification accuracy scores, it also correctly identified subgenus resulting in a mean of 96%. Regarding species identification, 88 from 132 possible comparisons resulted in 100%, identification accuracy. Our results showed that *Aedes*, *Culex* and *Anopheles* were correctly distinguished by wing shape. When subjected to the analysis of lower hierarchical levels of subgenera (when present) and species, the wing geometric morphometric was also efficient resulting in high reclassification scores.