Article

Relative warp analysis of wing shape variations in three selected populations of *Aedes aegypti* Linnaeus

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Abstract

Population variations in the dengue vector mosquito, *Aedes aegypti* (Linneaus) was examined using landmark-based Geometric Morphometric methods of the left and right wings for both sexes from among three locations in the city of Cagayan de Oro, Philippines. Relative Warp Analysis (RWA) was conducted on both wings based on shape scores for the detection of variations within and between the three populations. Canonical variate analysis (CVA) of the relative warp scores yielded Wilk's lambda that were very near zero and Pillai trace that were at or near values of 1 indicating that wing shape scores among the three populations of mosquito had means that were different from each other. Discriminant analysis have shown the three *Aedes aegypti* populations differ significantly (>70% correct classification) based on the male's left and right wings and the females' right wing. The rural population was also correctly classified based on the right wings of both sexes. What is interesting in the results is that all three populations were not correctly classified based on the female's left wing. These indicate that the wings of the rural male and all the female populations of *Aedes aegypti* were asymmetrical in shapes which may be due to genetic, developmental, or as a result of environmental processes and are "probably normally adaptive". These findings strongly demonstrate strong infraspecific variations in wing structures of *Aedes aegypti* at different areas of Cagayan de Oro City.

Keywords Warp; Wilk's lambda; Pillai trace; discriminant; CVA

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1 Introduction

Aedes aegypti has been described to be the most variable of all mosquito species (Mattingly, 1957; Katyal, 1996; Henry et al., 2010; Jupp et al., 1991) recognized as having three forms*:* a black form, known as *Aedes aegypti* subspecies *formosus,* Walker (1948), a pale form, known as *Aedes aegypti* variety *queenslandensis,* Theobald (1901) and the intermediate form known as *Aedes aegypti aegypti* or the *Sensu strict* or type-form

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