

Geometric-Morphometric Analysis of Head, Pronotum and Elytra of *Brontispa Longissima* Gestro in Selected Provinces of the Philippines

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Abstract : This study was conducted to describe variations in the shapes of the elytra, head and pronotum of populations of adult *Brontispa longissima* (Gestro) infesting coconut farms from selected areas in the Philippines using Cluster Analysis, Relative Warp Analysis coupled with box plot and histograms and Procrustean analysis. The data used in this study included shape residuals captured using the method of landmark based geometric morphometrics. Results: The results of the cluster analyses based on the average shapes of the elytra, head and pronotum shows no consistent pattern of similarity between and among five populations of *B. longissima*. When localized variations using Relative Warp Analysis coupled with box plot and histograms was done, the findings revealed that RWA was only successful in summarizing variations using two relative warps in the shape of the elytra where the first two warps contained 86.29% of the variations of the female and 85.48% for the males. For the head and pronotum, the first two relative warps captured less than 50% of the overall variation. Looking at the shapes of the frequency histograms, all were found to follow a unimodal distribution. The box plots reveal no consistent results. Among the three characters studied only the elytra were more robust and reliable compared to head and pronotum and then Tandag differ from the rest of the other over-lapping populations. On the other hand, Procrustean Analyses revealed that elytra were more spread in the posterior region both in male and female. The coordinates in head and pronotum were evenly distributed. In the overlapping consensus configurations show that variability was exaggerated in the right side of the elytra and the posterior parts of the head and pronotum. Results also showed expansion among females while compression among males in elytra. For males, expansion are localized in the posterior part of the elytra, For the head, results showed asymmetry in the distribution of expansion areas where expansion are observed in the right postero-lateral aspect of the female head. Conclusion: The overall results may imply that they might belong to one operational taxonomic unit or ecotype or biotype. Geography might not be the factor responsible for the differentiation of the populations of *B. longissima*.

Keywords : cluster analysis, relative warp analysis, procrustean analysis, environmental parameters

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