PHENOTYPIC CHARACTERIZATION AND PHYLOGENETIC INFERENCE OF WING SHAPE IN SAND FLIES OF THE SUBTRIBE PSYCHODOPYGINA (DIPTERA: PSYCHODIDAE: PHLEBOTOMINAE)

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The sand fly subtribe Psychodopygina (Diptera: Psychodidae: Phlebotominae), stands out due to its involvement in the transmission of leishmaniasis agents. The use of supplementary tools, through integrative taxonomy approaches, such as Geometric Morphometrics (GM), can help to improve the taxonomy and systematics of this group, which remains advancing. Thus, we aimed to provide a phenotypic characterization and assess the phylogenetic signal of wing shape within Psychodopygina.

At least one species of each genus of Psychodopygina was selected, considering their availability on the collections - University of São Paulo Museum of Zoology, and Instituto Evandro Chagas. The coordinates of 13 landmarks from male wings were digitized using tpsDIG. MorphoJ software was used to estimate the shape variation, morphological diversity, calculate centroid size (CS), and perform principal component (PCA) and canonical variate (CVA) analyses. Phylogenetic inference was performed based on a matrix of Mahalanobis distance, subjected to analysis using Unweighted Pair Group Method with Arithmetic Mean (UPGMA) and Neighbor-Joining clustering algorithms.

The following *taxa*, *Bichromomyia* (1 sp., n = 47)*, Martinsmyia* (2 spp., n = 27), *Nyssomyia* (8 spp., n = 159), *Psathyromyia* (11 spp., n = 140)*, Psychodopygus* (13 spp., n = 147)*, Trichophoromyia* (5 spp., n = 180) and *Viannamyia* (2spp., n = 25), were assessed; a representative of Brumptomyina, *Brumpromyia avellari* (n = 30)*, was included as an outgroup, totaling 713 wings. All genera partially shared the same phylomorphospace on CVA and PCA. On CVA, however, *Trichophoromyia, Nyssomyia* and *Viannamyia* grouped further apart. *Viannamyia* comprised the most divergent genus based on CS, CVA, PCA and UPGMA, as well presented the greatest estimated morphological diversity. All CS were distinct on genera-comparisons, with exception of *Bichromomyia-Psychodopygus*. The topologies produced by the wing shape partially correspond with that of literature-based molecular data.

These results prove the importance and potential application of wing shapes in recovering the relationships among sand flies