Compartmentalization in Lepidopteran Development: Anterior Posterior Boundary Location and Interaction in Genus Morpho

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Compartments in development are defined as separate cell populations that organize cell destiny and differentiation. Of particular interest is the anterior-posterior compartment. First analyzed in D. melanogaster, it is necessary to expand clonal analysis outside of simple model organisms to further the current extent of developmental knowledge. This study investigated the location of the anterior-posterior compartment in genus Morpho using clonal analysis with gynandromorphism as the coloration mutation for tracing. Specimens were adjusted in size and shape to fit a template before clones were traced. Fiji (ImageJ 2) analysis revealed that in the forewing, the boundary follows the M1 vein before bisecting the discoidal cell, and in the hindwing, the boundary is located between the M1 and M2 veins before similarly bisecting the discoidal region. There is a notable discontinuity in the curve of the boundary line that presents opportunity for further analysis related to evolutionary advantage of discontinuous shape. The results of this analysis resolve the dispute regarding the location of the boundary.

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