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Differentiation of biological forms of *Anopheles stephensi* (Diptera, Culicidae) recorded in Jaffna District, Sri Lanka, using egg morphology and morphometry

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Background: *Anopheles stephensi* is a primary vector for urban malaria transmission. Three biotypes of *An. stephensi* could be identified, as type, intermediate, and *mysorensis*, distinguished by egg morphology. Since each type has a different vectorial potential, the characterization of biological types is useful for identifying the entomological potential for disease transmission.

Objective: To characterize the biotypes of *An. stephensi* by egg morphology and morphometry.

Method: Entomological surveys were conducted at three selected localities (Columbuthurai, Kurunagar, and Navanthurai) in Jaffna District, Sri Lanka using cattle baited net traps. Field collections were identified morphologically and blood-fed female *An. stephensi* were transferred individually to sterile plastic tubes (15 cm in length and 2 cm in diameter) with a wet filter paper-lined at the bottom to induce oviposition. The number of ridges on one side of the egg-float was examined (x100) under a compound light microscope. Morphometric characteristics of eggs (length and breadth on the egg float) in each biotype (n=250) were recorded. The General Linear Model (GLM) was used to determine variations of morphometric traits between the biotypes.

Results: Only type and intermediate biotypes were encountered. Eggs of intermediate form had a mean length of 0.6 ± 0.01 mm and a breadth of 0.3 ± 0.01 mm. The morphometry of the type form indicated a mean length and breadth of 0.6 ± 0.01 mm and 0.3 ± 0.01 mm, respectively. The egg length to breadth ratio was 0.9 ± 0.01 mm and 1.0 ± 0.1 mm in intermediate and type, respectively. The egg length ($p=0.021$), breadth ($p=0.029$), and length to breadth ratio ($p=0.021$) were significantly different between the two biotypes.

Conclusion: Eggs of type biotype were significantly larger than the intermediate form. Differences in the egg morphometry in biotypes suggest that these parameters could be used to differentiate the biotypes of *An. stephensi* in addition to the number of egg ridges.

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