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The range of salinity tolerance by *Anopheles stephensi* in Sri Lanka

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Background: Malaria vectors breed in clean, clear, and sunlit water habitats. Recent studies evidenced that they can breed in brackish and polluted water. Breeding of *Anopheles* mosquitoes in sites, that are exceptional from typical habitats, is of ecological and epidemiological significance, since it plays a key role in determining their ecological distribution.

Objective: To determine the developmental responses and level of tolerance of *Anopheles stephensi* larval stages to different salt concentrations.

Method: A colony of *An. stephensi* was established using blood fed adult females caught from cattle baited net trap collections from Columbuturai, Kurunagar and Navanthurai areas in affna. Batches of 100 first and third instars were exposed to a salinity gradient (0-40 ppt) in 150 ml capacity. Adult emergence at each concentration was recorded. The experimental setup was repeated four times. Data were analysed using general linear model.

Results: Both first and third instars of *An. stephensi* had significant variations in adult emergence at different salinity ($p < 0.05$). Percentage adult emergence of both first and third instars decreased with increasing salinity. First instar had a moderate adult emergence rate of 60% at 17.5 ppt. In third instar, the adult emergence rate remained $>80.0\%$ at salinity levels <17.5 ppt. Adult emergence of $>90\%$ was observed at 10 and 15 ppt for first and third instars, respectively. Interestingly, both larval stages reported low adult emergence rates of 6.7% and 30%, respectively even at 22.5 ppt, indicating that *An. stephensi* is capable to breed in brackish water.

Conclusion: Both first and third instars of *An. stephensi* are able to survive at salinity levels close to sea water (30 ppt) indicating a high potential of increasing the density of *An. stephensi* in coastal ecosystems. Therefore, these findings suggest that larval control measures have to be employed in both fresh and brackish/saline water bodies.

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