**Table 1** Parameters used in the *VC* calculation.Parameters sourced from Mordecai et al. [30] were mathematically estimated at a constant temperature of 27 °C, the temperature at which our adult mosquitoes were housed. Parameters that included carry-over effects are starred.

|  |  |  |  |
| --- | --- | --- | --- |
| **Parameter** | **Definition** | **Source** | **Mean (Range)a** |
|  | Per-mosquito bite rate | Mordecai et al. [30] | 0.294 (-) |
| \* | Vector competence | Present study | 0.107 (0–0.353) |
|  | Adult mosquito mortality rate | Mordecai et al. [30] | 0.011 (-) |
|  | Extrinsic incubation rate (inverse of extrinsic incubation period) | Mordecai et al. [30] | 0.196 (-) |
| \* | No. of eggs produced per female mosquito per day | Present study | 18.678 (15.260–22.800) |
|  | Egg-to-adult survival probability | Present study | 0.485 (0.090–0.775) |
|  | Larval development rate | Present study | 0.056 (0.027–0.087) |

aMean and range are shown for each parameter, except for those calculated at a constant adult environmental temperature which did not change

**Table 2** Mean microclimate values (95% confidence intervals) across season and land class. Letters represent significant differences as measured by pairwise comparison using Tukey's multiple comparison of means, adjusting for significance with the Holm-Bonferroni method

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Microclimate variables** | **Summer** | | | **Autumn** | | |
| **Rural** | **Suburban** | **Urban** | **Rural** | **Suburban** | **Urban** |
| Minimum temperature (°C) | 21.73  (20.93–22.53)a | 22.00  (21.20–22.80)a | 22.67  (21.87–23.47)a | 11.03  (10.23–11.83)b | 12.23  (11.43–13.03)bc | 13.41  (12.61–14.21)c |
| Mean temperature (°C) | 27.58  (27.13–28.02)a | 27.38  (26.94–27.83)a | 27.45  (27.01–27.90)a | 19.45  (19.01–19.89)b | 19.55  (19.10–19.99)b | 19.95  (19.51–20.40)b |
| Maximum temperature (°C) | 31.53  (30.76–32.30)a | 30.86  (30.09–31.63)a | 31.40  (30.63–32.17)a | 27.57  (26.80–28.34)b | 26.58  (25.81–27.35)b | 26.85  (26.08–27.62)b |
| Daily temperature range (°C) | 9.81  (8.51–11.11)a | 8.86  (7.56–10.16)a | 8.73  (7.43–10.03)a | 16.54  (15.24–17.84)b | 14.35  (13.05–15.65)bc | 13.44  (12.14–14.74)c |
| Minimum relative humidity (%) | 73.49  (69.39–77.59)ab | 76.29  (72.19–80.39)a | 67.40  (63.30–71.50)b | 47.68  (43.58–51.78)c | 48.84  (44.74–52.94)c | 44.14  (40.04–48.24)c |
| Mean relative humidity (%) | 89.01  (86.23–91.780)ab | 90.38  (87.61–93.16)a | 84.43  (81.66–87.20)b | 75.39  (72.61–78.16)c | 75.57  (72.79–78.34)c | 69.01  (66.23–71.78)d |
| Maximum relative humidity (%) | 99.95  (97.14–100.00)a | 99.98  (97.17–100.00)a | 98.38  (95.58–100.00)a | 99.36  (96.56–100.00)b | 98.93  (96.12–100.00)b | 91.77  (88.97–94.58)c |
| Daily humidity range (%) | 26.46  (22.07–30.85)a | 23.69  (19.30–28.08)a | 30.98  (26.59–35.37)a | 51.69  (47.29–56.08)b | 50.09  (45.70–54.49)b | 47.63  (43.24–52.02)b |

**Table 3** GZLM model results of land class, season and their interaction on demographic and infection rates. Significance was assessed via Wald Chi-square tests () and there was no evidence that data failed to meet assumptions of normality

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Variable of Interest** | **Class** | | | **Season** | | | **Class\*Season** | | |
|  | ***df*** | ***χ*2** | ***P*-valuea** | ***df*** | ***χ*2** | ***P*-valuea** | ***df*** | ***χ*2** | ***P*-valuea** |
| Egg-to-adult survival | 2 | 0.0361 | 0.982 | 1 | 61.129 | **< 0.001** | 2 | 5.891 | 0.0526 |
| Development rate | 2 | 3.847 | 0.1461 | 1 | 597.51 | **< 0.001** | 2 | 3.108 | 0.2114 |
| Wing length | 2 | 0.8348 | 0.6587 | 1 | 2.7937 | 0.0946 | 2 | 14.748 | **< 0.001** |
| Per capita growth (r’) | 2 | 0.667 | 0.717 | 1 | 219.84 | **< 0.001** | 2 | 2.622 | 0.23 |
| Infection | 2 | 18.168 | **< 0.001** | 1 | 12.271 | **< 0.001** | 2 | 1.985 | 0.371 |
| Dissemination | 2 | 14.253 | **< 0.001** | 1 | 14.909 | **< 0.001** | 2 | 0.941 | 0.625 |
| Infectiousness | 2 | 1.105 | 0.575 | 1 | 3.63 | 0.057 | 2 | 0.302 | 0.860 |
| Vectorial capacity | 2 | 0.161 | 0.922 | 1 | 5.721 | **0.017** | 2 | 0.905 | 0.636 |

aSignificant effects at the 0.05 level are bolded.

Table 4 Dengue infection rates. The rates of infection (mosquitoes with dengue positive bodies), dissemination (infected mosquitoes with dengue positive heads) and infectiousness (infected mosquitoes with dengue positive saliva) across season and land class. Raw numbers of positive samples are shown with the denominator in parentheses

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Season** | **Land class** | **No. infected (*n*)** | **No. disseminated (n)** | **No. infectious (*n*)** |
| Summer | Rural | 22 (56) | 19 (60) | 6 (60) |
| Suburban | 32 (57) | 26 (57) | 10 (57) |
| Urban | 10 (51) | 10 (53) | 7 (53) |
| Autumn | Rural | 32 (50) | 30 (50) | 3 (47) |
| Suburban | 28 (43) | 25 (41) | 3 (43) |
| Urban | 26 (59) | 22 (57) | 4 (59) |

*Abbreviation*: *n* = sample size