**Supplementary materials**

Evaluation of conserved RNA secondary structures within and between geographic lineages of Zika virus

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**Figure S1**. Results of the two-way ANOVA, comparing the window size factor (100, 120 and 150), and the sliding size factor (20.40). (A) Boxplot of the window size factor. (B) Boxplot of the slip size factor (C) Output two-way ANOVA. (D) Tukey plot of the window size factor. Statistical assumptions: Normality Shapiro test ( p value = 0.0533), Bartlett homoscedasticity test (Window p value = 0.1674, Slide p value = 0.02).



**Figure S2.** RNA most representative structures of the genomic regions at intra-geographic lineages level. (A) unique pattern structure found in Asia. (B, C) unique pattern structures found in America.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Region** | **L** | **W** | **%Fp** | **Region** | **L** | **W** | **%Fp** | **Region** | **L** | **W** | **%Fp** | **Region** | **L** | **W** | **%Fp** | **Region** | **L** | **W** | **%Fp** |
| Global | 1 | 1 | 0,01 | Africa | 1 | 9 | 0 | America | 1 | 15 | 0,025 | Asia | 1 | 12 | 0,03 | Oceania | 1 | 12 | 0,035 |
| Global | 1 | 2 | 0 | Africa | 1 | 10 | 0,005 | America | 1 | 16 | 0,025 | Asia | 1 | 13 | 0,015 | Oceania | 1 | 14 | 0,03 |
| Global | 1 | 3 | 0 | Africa | 1 | 11 | 0 | America | 2 | 17 | 0,03 | Asia | 2 | 14 | 0,025 | Oceania | 1 | 15 | 0,06 |
| Global | 1 | 4 | 0 | Africa | 2 | 12 | 0,01 | America | 3 | 18 | 0,02 | Asia | 3 | 15 | 0,02 | Oceania | 1 | 16 | 0,03 |
| Global | 1 | 5 | 0 | Africa | 3 | 13 | 0,015 | America | 4 | 19 | 0,025 | Asia | 4 | 16 | 0,04 | Oceania | 2 | 18 | 0,045 |
| Global | 1 | 6 | 0 | Africa | 4 | 14 | 0,01 | America | 6 | 22 | 0,03 | Asia | 5 | 17 | 0,03 | Oceania | 4 | 21 | 0,035 |
| Global | 1 | 7 | 0,005 | Africa | 4 | 15 | 0,005 | America | 8 | 26 | 0,03 | Asia | 6 | 19 | 0,04 | Oceania | 5 | 23 | 0,035 |
| Global | 1 | 8 | 0,005 | America | 1 | 1 | 0 | America | 9 | 27 | 0,015 | Asia | 8 | 22 | 0,01 | Oceania | 5 | 24 | 0,035 |
| Global | 1 | 9 | 0 | America | 1 | 2 | 0 | America | 9 | 28 | 0,015 | Asia | 8 | 23 | 0,025 | Oceania | 5 | 25 | 0,055 |
| Global | 1 | 10 | 0,005 | America | 1 | 3 | 0,005 | America | 9 | 29 | 0,01 | Asia | 9 | 24 | 0,045 | Oceania | 5 | 26 | 0,06 |
| Global | 1 | 11 | 0 | America | 1 | 4 | 0,015 | Asia | 1 | 1 | 0 | Oceania | 1 | 1 | 0,01 | Oceania | 5 | 29 | 0,025 |
| Global | 1 | 12 | 0 | America | 1 | 5 | 0,05 | Asia | 1 | 2 | 0,025 | Oceania | 1 | 2 | 0,02 | Oceania | 6 | 31 | 0,04 |
| Global | 2 | 13 | 0,005 | America | 1 | 6 | 0,085 | Asia | 1 | 3 | 0,005 | Oceania | 1 | 3 | 0,035 | Oceania | 8 | 36 | 0,03 |
| Africa | 1 | 1 | 0,005 | America | 1 | 7 | 0,045 | Asia | 1 | 4 | 0,02 | Oceania | 1 | 4 | 0,035 | Oceania | 10 | 40 | 0,045 |
| Africa | 1 | 2 | 0,005 | America | 1 | 8 | 0,02 | Asia | 1 | 5 | 0,03 | Oceania | 1 | 5 | 0,03 | Oceania | 13 | 46 | 0,025 |
| Africa | 1 | 3 | 0,01 | America | 1 | 9 | 0,03 | Asia | 1 | 6 | 0,005 | Oceania | 1 | 6 | 0,065 | Oceania | 13 | 47 | 0,02 |
| Africa | 1 | 4 | 0,025 | America | 1 | 10 | 0,035 | Asia | 1 | 7 | 0,025 | Oceania | 1 | 7 | 0,02 | Oceania | 13 | 48 | 0,035 |
| Africa | 1 | 5 | 0,045 | America | 1 | 11 | 0,045 | Asia | 1 | 8 | 0,015 | Oceania | 1 | 8 | 0,02 | / | / | / | / |
| Africa | 1 | 6 | 0,035 | America | 1 | 12 | 0,015 | Asia | 1 | 9 | 0,015 | Oceania | 1 | 9 | 0,01 | / | / | / | / |
| Africa | 1 | 7 | 0,015 | America | 1 | 13 | 0,045 | Asia | 1 | 10 | 0,015 | Oceania | 1 | 10 | 0,045 | / | / | / | / |

**Table S1.** Statistical evaluation in the randomized alignments performed by each window detected as positive for structural RNA at inter-geographic lineages level. (L = Locus, W = Window, %FP = False positives rate)

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Region** | **L** | **W** | **%Fp** | **Region** | **L** | **W** | **%Fp** | **Region** | **L** | **W** | **%Fp** | **Region** | **L** | **W** | **%Fp** | **Region** | **L** | **W** | **%Fp** | **Region** | **L** | **W** | **%Fp** |
| Asia\_cont | 1 | 1 | 0,01 | Asia\_sure | 1 | 3 | 0,015 | Bl\_Bra | 1 | 7 | 0,025 | Bl\_Car | 2 | 9 | 0,03 | Bl\_Col | 2 | 5 | 0,055 | Bl\_Col | 16 | 48 | 0,02 |
| Asia\_cont | 1 | 2 | 0,03 | Asia\_sure | 1 | 4 | 0,04 | Bl\_Bra | 1 | 8 | 0,08 | Bl\_Car | 2 | 10 | 0,025 | Bl\_Col | 2 | 6 | 0,04 | Bl\_Col | 16 | 49 | 0,04 |
| Asia\_cont | 1 | 3 | 0,03 | Asia\_sure | 1 | 5 | 0,03 | Bl\_Bra | 1 | 9 | 0,025 | Bl\_Car | 2 | 11 | 0,045 | Bl\_Col | 2 | 7 | 0,03 | Bl\_Mex | 1 | 7 | 0,045 |
| Asia\_cont | 1 | 4 | 0,05 | Asia\_sure | 1 | 6 | 0,045 | Bl\_Bra | 1 | 10 | 0,04 | Bl\_Car | 2 | 12 | 0,03 | Bl\_Col | 2 | 8 | 0,05 | Bl\_Mex | 1 | 8 | 0,04 |
| Asia\_cont | 1 | 5 | 0,055 | Asia\_sure | 1 | 7 | 0,01 | Bl\_Bra | 1 | 11 | 0,035 | Bl\_Car | 2 | 13 | 0,02 | Bl\_Col | 2 | 9 | 0,035 | Bl\_Mex | 1 | 9 | 0,03 |
| Asia\_cont | 1 | 6 | 0,06 | Asia\_sure | 1 | 8 | 0,02 | Bl\_Bra | 1 | 12 | 0,03 | Bl\_Car | 2 | 15 | 0,04 | Bl\_Col | 2 | 10 | 0,045 | Bl\_Mex | 1 | 10 | 0,035 |
| Asia\_cont | 1 | 7 | 0 | Asia\_sure | 1 | 9 | 0,01 | Bl\_Bra | 1 | 13 | 0,06 | Bl\_Car | 2 | 16 | 0,035 | Bl\_Col | 2 | 11 | 0,045 | Bl\_Mex | 1 | 11 | 0,045 |
| Asia\_cont | 1 | 8 | 0,04 | Asia\_sure | 1 | 10 | 0,03 | Bl\_Bra | 1 | 15 | 0,065 | Bl\_Car | 2 | 17 | 0,025 | Bl\_Col | 2 | 12 | 0,045 | Bl\_Mex | 1 | 12 | 0,03 |
| Asia\_cont | 1 | 9 | 0,035 | Asia\_sure | 1 | 11 | 0,025 | Bl\_Bra | 1 | 16 | 0,03 | Bl\_Car | 3 | 18 | 0,015 | Bl\_Col | 2 | 13 | 0,02 | Bl\_Mex | 1 | 13 | 0,02 |
| Asia\_cont | 1 | 10 | 0 | Asia\_sure | 1 | 12 | 0,04 | Bl\_Bra | 1 | 17 | 0,075 | Bl\_Car | 4 | 20 | 0,045 | Bl\_Col | 2 | 14 | 0,045 | Bl\_Mex | 1 | 14 | 0,045 |
| Asia\_cont | 1 | 11 | 0,085 | Asia\_sure | 1 | 13 | 0,03 | Bl\_Bra | 2 | 20 | 0,045 | Bl\_Car | 6 | 23 | 0,04 | Bl\_Col | 2 | 15 | 0,025 | Bl\_Mex | 1 | 15 | 0,03 |
| Asia\_cont | 1 | 12 | 0,085 | Asia\_sure | 2 | 14 | 0,03 | Bl\_Bra | 3 | 23 | 0,035 | Bl\_Car | 6 | 24 | 0,045 | Bl\_Col | 2 | 16 | 0,07 | Bl\_Mex | 1 | 16 | 0,03 |
| Asia\_cont | 1 | 13 | 0,07 | Asia\_sure | 3 | 15 | 0,01 | Bl\_Bra | 5 | 26 | 0,03 | Bl\_Car | 6 | 25 | 0,035 | Bl\_Col | 4 | 20 | 0,045 | Bl\_Mex | 1 | 17 | 0,025 |
| Asia\_cont | 1 | 16 | 0,045 | Asia\_sure | 4 | 16 | 0,035 | Bl\_Bra | 6 | 27 | 0,045 | Bl\_Car | 6 | 26 | 0,055 | Bl\_Col | 4 | 22 | 0,03 | Bl\_Mex | 2 | 19 | 0,045 |
| Asia\_cont | 1 | 17 | 0,055 | Asia\_sure | 5 | 17 | 0,02 | Bl\_Bra | 8 | 32 | 0,045 | Bl\_Car | 6 | 27 | 0,065 | Bl\_Col | 6 | 25 | 0,02 | Bl\_Mex | 4 | 22 | 0,025 |
| Asia\_cont | 2 | 19 | 0,03 | Asia\_sure | 7 | 19 | 0,015 | Bl\_Bra | 11 | 37 | 0,015 | Bl\_Car | 6 | 29 | 0,045 | Bl\_Col | 7 | 26 | 0,03 | Bl\_Mex | 6 | 25 | 0,015 |
| Asia\_cont | 4 | 21 | 0,045 | Asia\_sure | 8 | 20 | 0,025 | Bl\_Bra | 14 | 42 | 0,045 | Bl\_Car | 7 | 31 | 0,025 | Bl\_Col | 7 | 27 | 0,04 | Bl\_Mex | 6 | 26 | 0,035 |
| Asia\_cont | 4 | 22 | 0,025 | Asia\_sure | 8 | 21 | 0,03 | Bl\_Bra | 14 | 43 | 0,045 | Bl\_Car | 10 | 37 | 0,04 | Bl\_Col | 7 | 28 | 0,65 | Bl\_Mex | 6 | 27 | 0,03 |
| Asia\_cont | 4 | 23 | 0,045 | Asia\_sure | 10 | 24 | 0,045 | Bl\_Bra | 14 | 44 | 0,03 | Bl\_Car | 13 | 43 | 0,04 | Bl\_Col | 7 | 29 | 0,04 | Bl\_Mex | 6 | 28 | 0,06 |
| Asia\_cont | 4 | 24 | 0,04 | Asia\_sure | 10 | 25 | 0,025 | Bl\_Bra | 15 | 47 | 0,045 | Bl\_Car | 14 | 44 | 0,02 | Bl\_Col | 7 | 30 | 0,02 | Bl\_Mex | 6 | 29 | 0,03 |
| Asia\_cont | 4 | 25 | 0,055 | Asia\_sure | 10 | 28 | 0,05 | Bl\_Car | 1 | 1 | 0,015 | Bl\_Car | 15 | 45 | 0,025 | Bl\_Col | 7 | 31 | 0,025 | Bl\_Mex | 6 | 30 | 0,01 |
| Asia\_cont | 7 | 30 | 0,045 | Asia\_sure | 10 | 30 | 0,015 | Bl\_Car | 2 | 2 | 0,015 | Bl\_Car | 15 | 46 | 0,03 | Bl\_Col | 8 | 32 | 0,065 | Bl\_Mex | 8 | 35 | 0,035 |
| Asia\_cont | 9 | 34 | 0,035 | Bl\_Bra | 1 | 1 | 0,02 | Bl\_Car | 2 | 3 | 0,02 | Bl\_Car | 15 | 47 | 0,025 | Bl\_Col | 10 | 36 | 0,055 | Bl\_Mex | 9 | 38 | 0,045 |
| Asia\_cont | 13 | 41 | 0,04 | Bl\_Bra | 1 | 2 | 0,07 | Bl\_Car | 2 | 4 | 0,03 | Bl\_Car | 16 | 49 | 0,04 | Bl\_Col | 10 | 37 | 0,025 | Bl\_Mex | 12 | 44 | 0,035 |
| Asia\_cont | 13 | 42 | 0,045 | Bl\_Bra | 1 | 3 | 0,005 | Bl\_Car | 2 | 5 | 0,09 | Bl\_Col | 1 | 1 | 0,005 | Bl\_Col | 12 | 41 | 0,025 | Bl\_Mex | 12 | 45 | 0,025 |
| Asia\_cont | 14 | 46 | 0,045 | Bl\_Bra | 1 | 4 | 0,01 | Bl\_Car | 2 | 6 | 0,03 | Bl\_Col | 2 | 2 | 0,015 | Bl\_Col | 15 | 45 | 0,03 | Bl\_Mex | 12 | 46 | 0,01 |
| Asia\_sure | 1 | 1 | 0,005 | Bl\_Bra | 1 | 5 | 0,08 | Bl\_Car | 2 | 7 | 0,04 | Bl\_Col | 2 | 3 | 0,025 | Bl\_Col | 15 | 46 | 0,045 | Bl\_Mex | 13 | 48 | 0,04 |

**Table S2.** Statistical evaluation in the randomized alignments performed by each window detected as positive for structural RNA at intra-geographic lineages level. (L = Locus, W = Window, %FP = False positives rate)