**Table S2.** **Selection pressure acting upon codons of WNV strains collected in the US (1999-2011), by host.**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Dataset** | **Codon** | **Protein**  **and AA #** | **Methods** | | | |  |
|  |  |  | **FEL** | **IFEL** | **SLAC** | **MEME** | **MEME only** |
|  |  |  | ***P* value** | | | |  |
| A (n=133), ω: 0.079  462 negatively selected sites |  |  |  |  |  |  |  |
| 1 | 1262 | NS2A119 | 0.02 | 0.72 | 0.21 | 0.02 |  |
| 2 | 1493 | NS2B119 | 0.33 | *0.14* | 0.45 | 0.04 | **√** |
| 3 | **2209\*** | **NS4A-A85T** | **0.02** | **0.05** | **0.13** | **0.02** |  |
| 4 | 2320 | NS4B47 | (0.67) | (0.47) | 0.67 | **0.02** | **√** |
| 5 | 2363 | NS4B90 | 0.06 | 1 | 0.48 | 0.06 |  |
| 6 | 2517 | NS4B244 | (0.09) | (0.22) | (0.99) | 0.04 | **√** |
| 7 | 2733 | NS5205 | (0.70) | (0.50) | (0.89) | 0.06 | **√** |
| 8 | 2734 | NS5206 | (0.58) | (0.36) | 0.57 | 0.01 | **√** |
| 9 | 3216 | NS5688 | (0.83) | (0.56) | (0.89) | 0.02 | **√** |
|  |  |  |  |  |  |  |  |
| M (n=167), ω: 0.102  361 negatively selected sites |  |  |  |  |  |  |  |
| 1 | 489 | E199 | 0.07 | 1 | 0.48 | 0.07 |  |
| 2 | 1031 | NS1240 | 0.09 | 1 | 0.47 | 0.09 |  |
| 3 | 1474 | NS2B100 | (0.63) | (0.34) | (0.89) | 0.02 | **√** |
| 4 | 1860 | NS3355 | 0.07 | 1 | 0.31 | 0.07 |  |
| 5 | 1941 | NS3436 | (0.33) | (0.21) | (0.89) | 0.08 | **√** |
| 6 | **2209\*** | **NS4A-A85T** | **0.04** | **0.02** | *0.19* | **0.04** |  |
| 7 | **2259** | **NS4A135** | **0.07** | *0.13* | **0.04** | **0.06** |  |
| 8 | 2393 | NS4B120 | (0.79) | (0.40) | (0.90) | 0.008 | **√** |
| 9 | 2842 | NS5314 | *0.12* | 0.08 | 0.24 | 0.01 | **√** |
| 10 | 3234 | NS5706 | 0.10 | 1 | 0.47 | 0.10 |  |
|  |  |  |  |  |  |  |  |
| H (n=61), ω: 0.127  231 negatively selected sites |  |  |  |  |  |  |  |
| 1 | 999 | NS1208 | 0.07 | 1 | 0.49 | 0.07 |  |
| 2 | 1438 | NS2B64 | 0.08 | 1 | 0.48 | 0.08 |  |
| 3 | **1841** | **NS3336** | **0.10** | **0.07** | *0.17* | **0.10** |  |
| 4 | **2209\*** | **NS4A-A85T** | **0.07** | **0.02** | **0.30** | **0.07** |  |
| 5 | 2842 | NS5314 | *0.12* | 0.04 | 0.22 | 0.06 |  |
| 6 | 3132 | NS5604 | 0.09 | 1 | 0.49 | 0.09 |  |
| 7 | 3240 | NS5712 | 0.26 | 1 | 0.30 | 0.004 | **√** |
|  |  |  |  |  |  |  |  |
| A+M (n=300), ω: 0.091  769 negatively selected sites |  |  |  |  |  |  |  |
| 1 | 468 | E178 | (0.55) | 0.54 | (0.73) | 0.02 | **√** |
| 2 | 800 | NS19 | 0.09 | 1 | 0.46 | 0.09 |  |
| 3 | 938 | NS1147 | 0.07 | 1 | 0.48 | 0.07 |  |
| 4 | 957 | NS1166 | (0.45) | (0.31) | (0.88) | 0.09 | **√** |
| 5 | 1031 | NS1240 | 0.08 | 1 | 0.46 | 0.08 |  |
| 6 | 1087 | NS1296 | (0.72) | (0.42) | (0.89) | 0.01 | **√** |
| 7 | **1262** | **NS2A119** | **0.01** | **1** | **0.10** | **0.01** |  |
| 8 | 1474 | NS2B100 | (0.24) | (0.22) | (0.96) | 0.02 | **√** |
| 9 | 1941 | NS3436 | (0.32) | (0.24) | (0.89) | 0.07 | **√** |
| 10 | **2209\*** | **NS4A-A85T** | **0.005** | **0.01** | **0.06** | **0.005** |  |
| 11 | 2259 | NS4A135 | 0.60 | 0.35 | *0.15* | 0.04 | **√** |
| 12 | 2320 | NS4B47 | (0.03) | (0.04) | (0.93) | 0.09 | **√** |
| 13 | 2393 | NS4B120 | (0.72) | (0.29) | (0.90) | 0.01 | **√** |
| 14 | 2517 | NS4B244 | (0.09) | (0.80) | (0.99) | 0.02 | **√** |
| 15 | 2733 | NS5205 | (0.28) | (0.24) | (0.96) | 0.10 | **√** |
| 16 | 2734 | NS5206 | (0.58) | (0.25) | 0.57 | 0.006 | **√** |
| 17 | 2842 | NS5314 | *0.12* | 0.06 | 0.24 | 0.01 | **√** |
| 18 | 3216 | NS5688 | (0.39) | (0.30) | (0.96) | 0.03 | **√** |
|  |  |  |  |  |  |  |  |
| ALL (n=363), ω: 0.105  969 negatively selected sites |  |  |  |  |  |  |  |
| 1 | 447 | E157 | (0.33) | (0.24) | (0.89) | 0.02 | **√** |
| 2 | 468 | E178 | (0.16) | 0.96 | (0.89) | 0.02 | **√** |
| 3 | 800 | NS19 | 0.04 | 1 | 0.32 | 0.04 |  |
| 4 | **938** | **NS1147** | **0.07** | **0.05** | **0.49** | **0.07** |  |
| 5 | 957 | NS1166 | (0.46) | (0.31) | (0.88) | 0.09 | **√** |
| 6 | 1031 | NS1240 | 0.04 | 1 | 0.32 | 0.03 |  |
| 7 | 1087 | NS1296 | (0.72) | (0.42) | (0.89) | 0.01 | **√** |
| 8 | 1108 | NS1317 | (0.25) | (0.22) | (0.96) | 0.06 | **√** |
| 9 | 1262 | NS2A119 | 0.008 | 1 | 0.10 | 0.008 |  |
| 10 | 1438 | NS2B64 | 0.008 | 1 | 0.49 | 0.08 |  |
| 11 | 1474 | NS2B100 | (0.09) | (0.13) | (0.99) | 0.03 | **√** |
| 12 | **1841** | **NS3336** | **0.09** | **0.07** | *0.16* | **0.09** |  |
| 13 | 1941 | NS3436 | (0.33) | (0.24) | (0.89) | 0.07 | **√** |
| 14 | 1959 | NS3454 | (0.23) | (0.23) | (0.99) | 0.09 | **√** |
| 15 | **2209**\* | **NS4A-A85T** | **0.002** | **0.01** | **0.03** | **0.002** |  |
| 16 | 2259 | NS4A135 | 0.56 | 0.34 | *0.15* | 0.04 | **√** |
| 17 | 2320 | NS4B47 | (0.03) | (0.04) | (0.93) | 0.06 | **√** |
| 18 | 2393 | NS4B120 | (0.70) | (0.28) | (0.90) | 0.008 | **√** |
| 19 | 2517 | NS4B244 | (0.09) | (0.77) | (0.99) | 0.02 | **√** |
| 20 | 2734 | NS5206 | (0.58) | (0.24) | 0.57 | 0.005 | **√** |
| 21 | **2842** | **NS5314** | **0.04** | **0.02** | **0.08** | **0.01** |  |
| 22 | 3132 | NS5604 | 0.08 | 1 | 0.49 | 0.08 |  |
| 23 | 3216 | NS5688 | (0.18) | (0.19) | (0.99) | 0.03 | **√** |

Table represent the analysis of the datasets from each host (A=avian, M=mosquito, A+M=avian + mosquito, H=human, ALL=all hosts origin). Open Reading Frame (3,433 codons). Includes codons only detected by MEME.  
\* Codon recognized in all datasets  
in bold, codons recognized by three or four methods, with statistical significance

ω = dN/dS ratio  
FEL = Fixed effects likelihood, IFEL = Internal Fixed effects likelihood, SLAC = Single-likelihood ancestor counting, MEME = Mixed Effects Model of Evolution.

Numbers between parentheses represent codons detected as negatively selected (with or without significance). Numbers in italics represent codons detected positively detected, not significantly, but close to *p* threshold (0.1)