***Virologica Sinica***

**Supplementary Data**

**Ungulate bocaparvovirus 4 and rodent bocavirus are different** **genotypes of the same species of virus**

Wenqiao He a, Yuhan Gao a, Yuqi Wen a, Xuemei Ke b, Zejin Ou a, Jiaqi Fu a, Mingji Cheng a, Yun Mo a,

Qing Chen a, \*

a Department of Epidemiology, School of Public Health, Guangdong Provincial Key Laboratory of Tropical Disease Research, Southern Medical University, Guangzhou 510515, China

b Xiamen Center for Disease Control and Prevention, Xiamen 361000, China

\*Corresponding author:

Email: 18002270308@163.com (Q. Chen)

ORCID: 0000-0002-2474-6697

Table S1. Primers using in viral amplification

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | Primer | Orientation | Sequence (5'-3') | Target fragment (base pairs) |
| Rodent bocavirus | F16 | Sense (first/second round) | GCATAAAACATGGAGTCCTAG | 900 (this study) |
| R915 | Antisense (second round) | CATGTAGTTAGCAATGAAGCTTC |
| R973 | Antisense (first round) | CTGGAACTTTGTAAGTATTTGAC |
| F848 | Sense (first/second round) | GACTTCTGCACTGTACTACAG | 780 (this study) |
| R1622 | Antisense (second round) | GATTCACATGCCAAATAGATTAC |
| R1661 | Antisense (first round) | GAGCAATCGTTAAACACAAAG |
| F1352 | Sense (first/second round) | CTAATAGAGCAGACTTTGAACATG | 942 (this study) |
| R2294 | Antisense (second round) | GAYTTCAGCAGTAGGGACG |
| R2323 | Antisense (first round) | GRCTCAGGACTTCCGAKATYG |
| F2158 | Sense (first/second round) | CTGACCCTCAATCTGATCTC | 1017 (this study) |
| R3178 | Antisense (second round) | GTAAACCTCCTACTTCTTGAG |
| R3268 | Antisense (first round) | CATTCTGGCCCTCTTAGCAC |
| F3175 | Sense (first/second round) | CCAGAACCTGAGATCCCTC | 980 (this study) |
| R4155 | Antisense (second round) | CATGTTGCCGTTTAGTCTGG |
| R4207 | Antisense (first round) | GTGCCCATGTAGTRTTGAATG |
| F4038 | Sense (first/second round) | CAATGTGATTTTAATCCACTAG | 1020 (this study) |
| R5058 | Antisense (second round) | CTATGTTAGTGTGTATTATGCTG |
| R5066 | Antisense (first round) | GCAATACACAGCATAATACACAC |

Table S2. Nucleotide acid identity for the near full-length genomes of bocaviruses.

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 | 28 |
| 1. HM053693.2 | ID | 0.932 | 0.451 | 0.456 | 0.449 | 0.45 | 0.459 | 0.458 | 0.47 | 0.468 | 0.466 | 0.467 | 0.468 | 0.469 | 0.464 | 0.468 | 0.468 | 0.466 | 0.467 | 0.464 | 0.468 | 0.466 | 0.467 | 0.469 | 0.434 | 0.484 | 0.511 | 0.480 |
| 2. HM053694.2 | 0.932 | ID | 0.454 | 0.459 | 0.454 | 0.451 | 0.460 | 0.459 | 0.472 | 0.470 | 0.470 | 0.470 | 0.470 | 0.471 | 0.467 | 0.471 | 0.471 | 0.470 | 0.470 | 0.467 | 0.471 | 0.470 | 0.470 | 0.472 | 0.436 | 0.485 | 0.511 | 0.483 |
| 3. NC\_016031.1 | 0.451 | 0.454 | ID | 0.892 | 0.782 | 0.415 | 0.423 | 0.417 | 0.425 | 0.422 | 0.424 | 0.423 | 0.423 | 0.423 | 0.423 | 0.423 | 0.423 | 0.424 | 0.424 | 0.422 | 0.424 | 0.423 | 0.423 | 0.424 | 0.490 | 0.428 | 0.511 | 0.419 |
| 4. JF429836.1 | 0.456 | 0.459 | 0.892 | ID | 0.825 | 0.417 | 0.424 | 0.419 | 0.426 | 0.426 | 0.426 | 0.426 | 0.426 | 0.425 | 0.426 | 0.424 | 0.426 | 0.425 | 0.427 | 0.424 | 0.426 | 0.424 | 0.427 | 0.424 | 0.495 | 0.425 | 0.441 | 0.423 |
| 5. NC\_016647.1 | 0.449 | 0.454 | 0.782 | 0.825 | ID | 0.427 | 0.429 | 0.421 | 0.427 | 0.428 | 0.427 | 0.426 | 0.426 | 0.427 | 0.425 | 0.427 | 0.425 | 0.425 | 0.427 | 0.424 | 0.426 | 0.426 | 0.426 | 0.427 | 0.495 | 0.424 | 0.444 | 0.429 |
| 6. KJ622366.1 | 0.450 | 0.451 | 0.415 | 0.417 | 0.427 | ID | 0.874 | 0.777 | 0.836 | 0.839 | 0.835 | 0.833 | 0.836 | 0.836 | 0.836 | 0.833 | 0.835 | 0.836 | 0.836 | 0.831 | 0.836 | 0.833 | 0.835 | 0.836 | 0.425 | 0.470 | 0.44 | 0.486 |
| 7. MF175076.1 | 0.459 | 0.460 | 0.423 | 0.424 | 0.429 | 0.874 | ID | 0.758 | 0.878 | 0.871 | 0.878 | 0.876 | 0.879 | 0.878 | 0.876 | 0.874 | 0.877 | 0.878 | 0.877 | 0.873 | 0.878 | 0.875 | 0.878 | 0.876 | 0.425 | 0.481 | 0.455 | 0.492 |
| 8. HQ291308.1 | 0.458 | 0.459 | 0.417 | 0.419 | 0.421 | 0.777 | 0.758 | ID | 0.744 | 0.745 | 0.745 | 0.744 | 0.746 | 0.744 | 0.745 | 0.744 | 0.745 | 0.745 | 0.745 | 0.741 | 0.745 | 0.743 | 0.745 | 0.745 | 0.421 | 0.477 | 0.467 | 0.495 |
| 9. KY927868.1 | 0.47 | 0.472 | 0.425 | 0.426 | 0.427 | 0.836 | 0.878 | 0.744 | ID | 0.947 | 0.951 | 0.949 | 0.949 | 0.979 | 0.935 | 0.980 | 0.948 | 0.951 | 0.948 | 0.945 | 0.948 | 0.949 | 0.947 | 0.982 | 0.419 | 0.484 | 0.449 | 0.499 |
| 10. MG365883.1 | 0.468 | 0.470 | 0.422 | 0.426 | 0.428 | 0.839 | 0.871 | 0.745 | 0.947 | ID | 0.969 | 0.983 | 0.988 | 0.946 | 0.961 | 0.943 | 0.986 | 0.968 | 0.986 | 0.963 | 0.989 | 0.965 | 0.986 | 0.946 | 0.422 | 0.482 | 0.472 | 0.500 |
| 11. MM451  (MW055885) | 0.466 | 0.470 | 0.424 | 0.426 | 0.427 | 0.835 | 0.878 | 0.745 | 0.951 | 0.969 | ID | 0.977 | 0.98 | 0.957 | 0.967 | 0.951 | 0.98 | 0.993 | 0.979 | 0.988 | 0.980 | 0.991 | 0.979 | 0.953 | 0.421 | 0.485 | 0.467 | 0.501 |
| 12. GZ301  (MW055886) | 0.467 | 0.470 | 0.423 | 0.426 | 0.426 | 0.833 | 0.876 | 0.744 | 0.949 | 0.983 | 0.977 | ID | 0.993 | 0.95 | 0.968 | 0.947 | 0.993 | 0.976 | 0.995 | 0.970 | 0.993 | 0.974 | 0.992 | 0.949 | 0.421 | 0.484 | 0.470 | 0.501 |
| 13. GZ652  (MW055887) | 0.468 | 0.470 | 0.423 | 0.426 | 0.426 | 0.836 | 0.879 | 0.746 | 0.949 | 0.988 | 0.980 | 0.993 | ID | 0.949 | 0.971 | 0.946 | 0.997 | 0.979 | 0.996 | 0.974 | 0.999 | 0.976 | 0.997 | 0.948 | 0.421 | 0.484 | 0.467 | 0.502 |
| 14. GZ4891  (MW055897) | 0.469 | 0.471 | 0.423 | 0.425 | 0.427 | 0.836 | 0.878 | 0.744 | 0.979 | 0.946 | 0.957 | 0.950 | 0.949 | ID | 0.939 | 0.99 | 0.948 | 0.955 | 0.948 | 0.950 | 0.948 | 0.953 | 0.947 | 0.990 | 0.42 | 0.484 | 0.468 | 0.500 |
| 15. XM863  (MW055888) | 0.464 | 0.467 | 0.423 | 0.426 | 0.425 | 0.836 | 0.876 | 0.745 | 0.935 | 0.961 | 0.967 | 0.968 | 0.971 | 0.939 | ID | 0.936 | 0.972 | 0.966 | 0.971 | 0.961 | 0.971 | 0.964 | 0.971 | 0.936 | 0.42 | 0.484 | 0.471 | 0.500 |
| 16. GZ4461  (MW055896) | 0.468 | 0.471 | 0.423 | 0.424 | 0.427 | 0.833 | 0.874 | 0.744 | 0.98 | 0.943 | 0.951 | 0.947 | 0.946 | 0.99 | 0.936 | ID | 0.946 | 0.95 | 0.946 | 0.948 | 0.946 | 0.948 | 0.944 | 0.991 | 0.419 | 0.484 | 0.465 | 0.498 |
| 17. GZ4591  (MW055889) | 0.468 | 0.471 | 0.423 | 0.426 | 0.425 | 0.835 | 0.877 | 0.745 | 0.948 | 0.986 | 0.980 | 0.993 | 0.997 | 0.948 | 0.972 | 0.946 | ID | 0.979 | 0.996 | 0.973 | 0.997 | 0.976 | 0.996 | 0.948 | 0.42 | 0.485 | 0.469 | 0.502 |
| 18. GZ131  (MW055890) | 0.466 | 0.470 | 0.424 | 0.425 | 0.425 | 0.836 | 0.878 | 0.745 | 0.951 | 0.968 | 0.993 | 0.976 | 0.979 | 0.955 | 0.966 | 0.950 | 0.979 | ID | 0.978 | 0.989 | 0.979 | 0.989 | 0.978 | 0.953 | 0.421 | 0.487 | 0.468 | 0.502 |
| 19. GZ241  (MW055892) | 0.467 | 0.470 | 0.424 | 0.427 | 0.427 | 0.836 | 0.877 | 0.745 | 0.948 | 0.986 | 0.979 | 0.995 | 0.996 | 0.948 | 0.971 | 0.946 | 0.996 | 0.978 | ID | 0.973 | 0.996 | 0.975 | 0.996 | 0.948 | 0.421 | 0.484 | 0.470 | 0.502 |
| 20. GZ871  (MW055893) | 0.464 | 0.467 | 0.422 | 0.424 | 0.424 | 0.831 | 0.873 | 0.741 | 0.945 | 0.963 | 0.988 | 0.970 | 0.974 | 0.950 | 0.961 | 0.948 | 0.973 | 0.989 | 0.973 | ID | 0.974 | 0.986 | 0.973 | 0.947 | 0.421 | 0.484 | 0.468 | 0.499 |
| 21. GZ911  (MW055894) | 0.468 | 0.471 | 0.424 | 0.426 | 0.426 | 0.836 | 0.878 | 0.745 | 0.948 | 0.989 | 0.980 | 0.993 | 0.999 | 0.948 | 0.971 | 0.946 | 0.997 | 0.979 | 0.996 | 0.974 | ID | 0.976 | 0.996 | 0.948 | 0.421 | 0.484 | 0.468 | 0.503 |
| 22. MLP191  (MW055895) | 0.466 | 0.470 | 0.423 | 0.424 | 0.426 | 0.833 | 0.875 | 0.743 | 0.949 | 0.965 | 0.991 | 0.974 | 0.976 | 0.953 | 0.964 | 0.948 | 0.976 | 0.989 | 0.975 | 0.986 | 0.976 | ID | 0.975 | 0.950 | 0.419 | 0.486 | 0.468 | 0.501 |
| 23. MLP271  (MW055891) | 0.467 | 0.470 | 0.423 | 0.427 | 0.426 | 0.835 | 0.878 | 0.745 | 0.947 | 0.986 | 0.979 | 0.992 | 0.997 | 0.947 | 0.971 | 0.944 | 0.996 | 0.978 | 0.996 | 0.973 | 0.996 | 0.975 | ID | 0.947 | 0.42 | 0.484 | 0.47 | 0.502 |
| 24. MLP521  (MW055898) | 0.469 | 0.472 | 0.424 | 0.424 | 0.427 | 0.836 | 0.876 | 0.745 | 0.982 | 0.946 | 0.953 | 0.949 | 0.948 | 0.99 | 0.936 | 0.991 | 0.948 | 0.953 | 0.948 | 0.947 | 0.948 | 0.950 | 0.947 | ID | 0.419 | 0.484 | 0.471 | 0.499 |
| 25. KP710213.1 | 0.434 | 0.436 | 0.49 | 0.495 | 0.495 | 0.425 | 0.425 | 0.421 | 0.419 | 0.422 | 0.421 | 0.421 | 0.421 | 0.420 | 0.42 | 0.419 | 0.420 | 0.421 | 0.421 | 0.421 | 0.421 | 0.419 | 0.420 | 0.419 | ID | 0.434 | 0.439 | 0.433 |
| 26. KU950356.1 | 0.484 | 0.485 | 0.428 | 0.425 | 0.424 | 0.47 | 0.481 | 0.477 | 0.484 | 0.482 | 0.485 | 0.484 | 0.484 | 0.484 | 0.484 | 0.484 | 0.485 | 0.487 | 0.484 | 0.484 | 0.484 | 0.486 | 0.484 | 0.484 | 0.434 | ID | 0.534 | 0.547 |
| 27. JN648103.1 | 0.511 | 0.511 | 0.441 | 0.444 | 0.440 | 0.455 | 0.467 | 0.449 | 0.472 | 0.467 | 0.470 | 0.467 | 0.468 | 0.471 | 0.465 | 0.469 | 0.468 | 0.470 | 0.468 | 0.468 | 0.468 | 0.470 | 0.468 | 0.471 | 0.439 | 0.534 | ID | 0.529 |
| 28. JQ692585.1 | 0.480 | 0.483 | 0.419 | 0.423 | 0.429 | 0.486 | 0.492 | 0.495 | 0.499 | 0.500 | 0.501 | 0.501 | 0.502 | 0.500 | 0.500 | 0.498 | 0.502 | 0.502 | 0.502 | 0.499 | 0.503 | 0.501 | 0.502 | 0.499 | 0.433 | 0.547 | 0.529 | ID |

HM053693.2, HM053694.2, NC\_016031.1, JF429836.1, NC\_016647.1, HQ291308.1, KJ622366.1: GenBank accesson numbers of bocavirus sequences from pigs.

MF175076.1, KY927868.1, MG365883.1: GenBank accesson numbers of bocavirus sequences from rodents.

KP710213.1 GenBank accesson number of bocavirus sequence from human.

KU950356.1 GenBank accesson number of bocavirus sequence from mink.

JN648103.1 GenBank accesson number of bocavirus sequence from dog.

JQ692585.1 GenBank accesson number of bocavirus sequence from cat.

1: *Rattus norvegicus;* 2: *Rattus tanezumi;* 3: *Rattus losea*

Table S3. Nucleotide composition analysis of the VP2 region

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | T(U) | C | A | G | GC | T-3 | C-3 | A-3 | G-3 | T3s | C3s | A3s | G3s | GC3s | ENC | CAI (refer to *Rattus sp.*) | CAI (refer to *Sus.sp*) |
| HM053693.2 | 15.5 | 28.1 | 28.3 | 28.0 | 0.561 | 11 | 37.7 | 18.2 | 32.6 | 0.1371 | 0.4515 | 0.2655 | 0.4286 | 0.688 | 42.67 | - | - |
| HM053694.2 | 15.3 | 28.1 | 29.1 | 27.5 | 0.556 | 11 | 37.1 | 20.8 | 30.6 | 0.1357 | 0.4426 | 0.3005 | 0.3941 | 0.661 | 44.77 | - | - |
| NC 016031.1 | 18.6 | 27.3 | 30.3 | 23.8 | 0.511 | 20 | 34.4 | 24.5 | 21.0 | 0.2564 | 0.4382 | 0.3536 | 0.2266 | 0.523 | 52.41 | - | - |
| JF429836.1 | 16.2 | 28.4 | 29.4 | 26.0 | 0.544 | 14 | 41.8 | 23.0 | 21.2 | 0.1734 | 0.5158 | 0.3325 | 0.2323 | 0.605 | 47.00 | - | - |
| NC 016647.1 | 14.6 | 29.1 | 29.7 | 26.6 | 0.557 | 11 | 43.4 | 21.4 | 24.6 | 0.1324 | 0.5434 | 0.3071 | 0.2805 | 0.658 | 44.03 | - | - |
| KJ622366.1 | 19.1 | 21.1 | 37.3 | 22.5 | 0.436 | 18 | 21.2 | 44.7 | 15.7 | 0.2260 | 0.2595 | 0.6447 | 0.1461 | 0.327 | 38.52 | 0.666 | 0.664 |
| MF175076.1 | 18.8 | 20.9 | 37.0 | 23.3 | 0.442 | 18 | 20.8 | 44.5 | 17.0 | 0.2190 | 0.2573 | 0.6387 | 0.1634 | 0.335 | 38.55 | 0.666 | 0.658 |
| KY927868.1 | 18.3 | 21.5 | 36.1 | 24.1 | 0.456 | 17 | 22.4 | 41.4 | 19.5 | 0.2059 | 0.2783 | 0.5958 | 0.2022 | 0.380 | 41.60 | 0.668 | 0.663 |
| MM45 (MW055885) | 18.1 | 21.5 | 36.9 | 23.5 | 0.451 | 16 | 22.6 | 44.0 | 17.7 | 0.1937 | 0.2793 | 0.6325 | 0.1742 | 0.363 | 38.78 | 0.682 | 0.675 |
| GZ489 (MW055897) | 18.0 | 21.7 | 36.3 | 24.0 | 0.457 | 16 | 23.0 | 41.8 | 19.3 | 0.1964 | 0.2844 | 0.6010 | 0.2000 | 0.384 | 40.63 | 0.672 | 0.666 |

Porcine bocavirus: HM053693.2, HM053694.2, NC 016031.1, JF429836.1, NC 016647.1, KJ622366.1;

Murine-associated porcine bocavirus: MF175076.1;

Rodent bocavirus: KY927868.1.

Table S4. Codon usage of different bocaviruses.

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Codon | HM053693.2 | HM053694.2 | NC\_016031.1 | JF429836.1 | NC\_016647.1 | KJ622366.1 | MF175076.1 | KY927868.1 | MM45 | GZ489 |
| RSCU | | | | | | | | | |
| UUU(F) | 0 | 0 | 1 | 0.73 | 0.73 | **1.41** | **1.33** | 0.71 | 0.94 | 0.71 |
| UUC(F) | **2** | **2** | 1 | **1.27** | **1.27** | 0.59 | 0.67 | **1.29** | **1.06** | **1.29** |
| UUA(L) | 0 | 0 | 0.46 | 0.24 | 0.75 | 1.15 | 0.69 | 1.15 | 0.92 | 0.92 |
| UUG(L) | 0.21 | 0.41 | 0.69 | 0.48 | 0 | 0.46 | 0.46 | 0.23 | 0.46 | 0.46 |
| CUU(L) | 0.21 | 0.21 | 0.46 | 0.24 | 0 | 0 | 0 | 0.46 | 0.23 | 0.46 |
| CUC(L) | 1.5 | 1.45 | 1.62 | **2.88** | **3.25** | 0.23 | 0.46 | 0.23 | 0.46 | 0.23 |
| CUA(L) | 0.43 | 0.83 | 0.69 | 0.72 | 0.25 | **2.77** | **2.77** | **2.54** | **2.54** | **2.77** |
| CUG(L) | **3.64** | **3.1** | **2.08** | 1.44 | 1.75 | 1.38 | 1.62 | 1.38 | 1.38 | 1.15 |
| AUU(I) | 0.5 | 0.65 | 0.46 | 0.46 | 0.21 | 0.88 | 1 | 0.72 | 0.6 | 0.69 |
| AUC(I) | **2** | **1.83** | **2.54** | **2.42** | **2.57** | 0.5 | 0.44 | 0.48 | 0.6 | 0.46 |
| AUA(I) | 0.5 | 0.52 | 0 | 0.12 | 0.21 | **1.63** | **1.56** | **1.8** | **1.8** | **1.85** |
| GUU(V) | 0 | 0.35 | 0.38 | 0 | 0.16 | 0.67 | 0.73 | 0.35 | 0.35 | 0.18 |
| GUC(V) | 1.12 | 0.52 | **2.67** | **2.38** | **2.56** | 0.67 | 0.18 | 0.35 | 0.52 | 0.73 |
| GUA(V) | 0.48 | 0.7 | 0.57 | 0.75 | 0.48 | **2** | **2.55** | **1.74** | 1.39 | **1.64** |
| GUG(V) | **2.4** | **2.43** | 0.38 | 0.88 | 0.8 | 0.67 | 0.55 | 1.57 | **1.74** | 1.45 |
| UCU(S) | 0.73 | 0.7 | **1.56** | 0.62 | 0.25 | 0.27 | 0.16 | 0.33 | 0.65 | 0.34 |
| UCC(S) | 1.17 | 0.7 | 1.33 | 1.66 | 1.75 | 0 | 0.32 | 0.33 | 0.16 | 0.34 |
| UCA(S) | 0.59 | 1.12 | 0.44 | 0.62 | 0.25 | **3.41** | **3.32** | **3.17** | **3.24** | **3.09** |
| UCG(S) | 0.88 | 0.84 | 1.11 | 0.62 | 1 | 0 | 0.16 | 0.17 | 0 | 0.17 |
| AGU(S) | 0.15 | 0.56 | 0.44 | 0.21 | 0.75 | 0.95 | 0.47 | 0.33 | 0.49 | 0.51 |
| AGC(S) | **2.49** | **2.09** | 1.11 | **2.28** | **2** | 1.36 | 1.58 | 1.67 | 1.46 | 1.54 |
| CCU(P) | 0.4 | 0.4 | **1.49** | **1.45** | 0.61 | 0.69 | 0.71 | 0.47 | 0.47 | 0.35 |
| CCC(P) | 0.3 | 0.4 | 0.46 | 0.48 | 0.97 | 0.34 | 0.24 | 0.24 | 0.24 | 0.24 |
| CCA(P) | 0.9 | 1 | 0.8 | 0.97 | 0.73 | **2.97** | **3.06** | **2.82** | **3.06** | **2.94** |
| CCG(P) | **2.4** | **2.2** | 1.26 | 1.09 | **1.7** | 0 | 0 | 0.47 | 0.24 | 0.47 |
| ACU(T) | 0.3 | 0.07 | 0.26 | 0.18 | 0.08 | 0.58 | 0.46 | 0.59 | 0.52 | 0.73 |
| ACC(T) | **1.63** | **1.68** | **1.7** | **1.73** | **1.71** | 0.51 | 0.46 | 0.59 | 0.52 | 0.51 |
| ACA(T) | 0.74 | 0.84 | 1.02 | 1 | 1.06 | **2.55** | **2.85** | **2.59** | **2.81** | **2.47** |
| ACG(T) | 1.33 | 1.4 | 1.02 | 1.09 | 1.14 | 0.36 | 0.23 | 0.22 | 0.15 | 0.29 |
| UAU(Y) | 0.42 | 0.31 | 0.85 | 0.64 | 0.33 | 0.37 | 0.52 | 1 | 0.93 | 0.93 |
| UAC(Y) | **1.58** | **1.69** | **1.15** | **1.36** | **1.67** | **1.63** | **1.48** | 1 | **1.07** | **1.07** |
| CAU(H) | 0.63 | 0.67 | 0.88 | 0.63 | 0.75 | 0.75 | 0.57 | 0.29 | 0.29 | 0.29 |
| CAC(H) | **1.38** | **1.33** | **1.13** | **1.37** | **1.25** | **1.25** | **1.43** | **1.71** | **1.71** | **1.71** |
| CAA(Q) | 0.5 | 0.72 | **1.6** | **1.38** | 0.83 | **1.42** | **1.36** | **1.38** | **1.52** | **1.38** |
| CAG(Q) | **1.5** | **1.28** | 0.4 | 0.62 | **1.17** | 0.58 | 0.64 | 0.62 | 0.48 | 0.62 |
| AAU(N) | 0.39 | 0.33 | 0.78 | 0.6 | 0.34 | 0.93 | 0.82 | 0.77 | 0.59 | 0.64 |
| AAC(N) | **1.61** | **1.67** | **1.22** | **1.4** | **1.66** | **1.07** | **1.18** | **1.23** | **1.41** | **1.36** |
| AAA(K) | 0.63 | 0.75 | **1.33** | **1.29** | **1.18** | **1.8** | **1.8** | **1.71** | **1.7** | **1.6** |
| AAG(K) | **1.38** | **1.25** | 0.67 | 0.71 | 0.82 | 0.2 | 0.2 | 0.29 | 0.3 | 0.4 |
| GAU(D) | 0.88 | 0.69 | 0.96 | 0.41 | 0.62 | 0.52 | 0.62 | 0.52 | 0.81 | 0.67 |
| GAC(D) | **1.13** | **1.31** | **1.04** | **1.59** | **1.38** | **1.48** | **1.38** | **1.48** | **1.19** | **1.33** |
| GAA(E) | 1 | **1.13** | **1.53** | 1 | **1.14** | **1.57** | **1.44** | **1.5** | **1.58** | **1.5** |
| GAG(E) | 1 | 0.87 | 0.47 | 1 | 0.86 | 0.43 | 0.56 | 0.5 | 0.42 | 0.5 |
| UGU(C) | 0.4 | 0.4 | 0.5 | 0.33 | 0 | **1.4** | **1.56** | **1.11** | **1.11** | **1.11** |
| UGC(C) | **1.6** | **1.6** | **1.5** | **1.67** | **2** | 0.6 | 0.44 | 0.89 | 0.89 | 0.89 |
| CGU(R) | 0.43 | 0.43 | 0.23 | 0.4 | 0.44 | 0.26 | 0 | 0 | 0 | 0 |
| CGC(R) | 0.64 | 0.86 | 1.38 | 1.4 | 1.33 | 0 | 0 | 0.27 | 0 | 0.26 |
| CGA(R) | 0.21 | 0.43 | 1.62 | 0.8 | 0.89 | 0.26 | 0.26 | 0.55 | 0.26 | 0.26 |
| CGG(R) | 0.64 | 0.43 | 0.46 | 0.4 | 0 | 0.52 | 0.78 | 0.27 | 0.52 | 0.26 |
| AGA(R) | **2.57** | **2.79** | **1.85** | **2.6** | **2.44** | **3.91** | **3.65** | **3.55** | **4.43** | **3.65** |
| AGG(R) | 1.5 | 1.07 | 0.46 | 0.4 | 0.89 | 1.04 | 1.3 | 1.36 | 0.78 | 1.57 |
| GGU(G) | 0.28 | 0.35 | 0.83 | 0.69 | 0.52 | 0.55 | 0.65 | 0.71 | 0.39 | 0.58 |
| GGC(G) | 0.56 | 0.49 | 1.21 | 1.13 | 0.97 | 0.55 | 0.65 | 0.52 | 0.71 | 0.58 |
| GGA(G) | **2.04** | **2.11** | **1.36** | **1.81** | **1.87** | **1.93** | **1.74** | **1.35** | **1.61** | **1.42** |
| GGG(G) | 1.12 | 1.05 | 0.6 | 0.38 | 0.65 | 0.97 | 0.97 | 1.42 | 1.29 | 1.42 |
| GCU(A) | 0.44 | 0.75 | 1.03 | 0.46 | 0.57 | 0.5 | 0.57 | 0.57 | 0.43 | 0.43 |
| GCC(A) | **1.48** | **1.5** | **1.26** | **2** | **2.17** | 0 | 0 | 0.43 | 0.43 | 0.43 |
| GCA(A) | 1.04 | 0.5 | 1.03 | 0.62 | 0.69 | **3.33** | **3.14** | **2.57** | **3** | **3.14** |
| GCG(A) | 1.04 | 1.25 | 0.69 | 0.92 | 0.57 | 0.17 | 0.29 | 0.43 | 0.14 | 0 |

Porcine bocavirus: HM053693.2, HM053694.2, NC 016031.1, JF429836.1, NC 016647.1, KJ622366.1;

Murine-associated porcine bocavirus: MF175076.1;

Rodent bocavirus: KY927868.1.