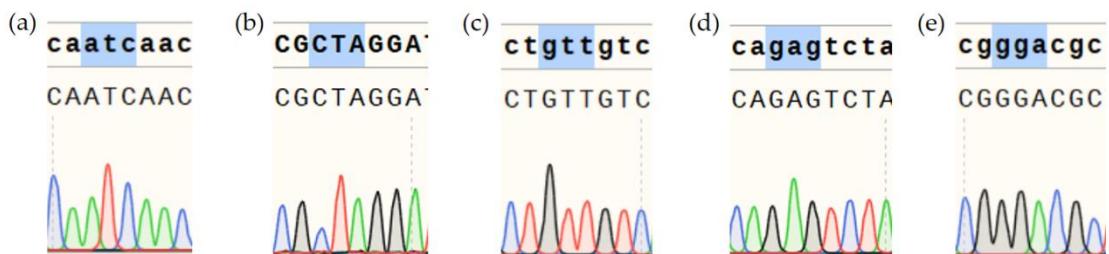


Table S1. Primers used for amplification of the ORF of YN2020-20 strain.

| Primer ^a | Position ^b | Sequence (5' - 3') |
|---------------------|-----------------------|-------------------------------|
| T1-f | 37-57 | TTGGAGTAGTGCCTGTGAACG |
| T1-r | 3033-3056 | AGCTCAGGTCACTGTGCACAGCTC |
| T2-f | 2906-2931 | TGGAATAGTATGAAGATTGAAGACTT |
| T2-r | 5792-5814 | GTGGTTATCACAAAATCCCATT |
| T3-f | 5668-5690 | CCTGATAGAGCTTCCAATTCTGG |
| T3-r | 8563-8586 | CAAATTCTCACCCATCAGCGAC |
| T4-f | 8223-8248 | ATGGCCGAGGAATGGCTAGCTAGGG |
| T4-r | 10938-10967 | ACCCACACTTCGGCGATCTGTGCCAAGTG |

^a f, forward primer; r, reverse primer.^b Position refer to the genome of BYD-1 (GenBank accession number JQ920420).**Figure S1.** (a), (b), (c), (d), and (e) are the alignment of amino acid loci E-358, NS1-113, NS4A-89, NS4B-D/E/N/C22S, and NS5-638 by sanger sequencing, respectively. The first row is the result of high-throughput sequencing, the second row is the result of singer sequencing. The blue area indicates an amino acid site.**Table S2.** Sequence information used for analysis in this study.

| Reference TMUVS | Year of collection | Location | Host | Accession No. |
|--------------------|--------------------|----------|----------|---------------|
| MM 1775 | 1955 | Malaysia | Mosquito | JX477685 |
| Sitiawan | 2000 | Malaysia | avian | JX477686 |
| DK/TH/CU-DTMUV2007 | 2007 | Thailand | avian | MF621927 |
| flavivirus | 2010 | China | avian | NC015843 |
| HB2010 | 2010 | China | avian | MN649262 |
| SD2010 | 2010 | China | avian | MN649260 |
| FX2010 | 2010 | China | avian | MH414568 |
| SH201001 | 2010 | China | avian | KY623443 |
| SH201002 | 2010 | China | avian | KY623442 |
| FX2010 | 2010 | China | avian | KY623434 |
| ZJ2010B2 | 2010 | China | avian | KY623422 |

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|----------------------|------|-------|-------|----------|
| HB201002 | 2010 | China | avian | KY623418 |
| HB201001 | 2010 | China | avian | KY623417 |
| FQ-C1 | 2010 | China | avian | KX977555 |
| ZJQT17 | 2010 | China | avian | KX977552 |
| AH-F10 | 2010 | China | avian | KM102539 |
| TMUV | 2010 | China | avian | KF192951 |
| LD 2010 | 2010 | China | avian | KC990544 |
| LC 2010 | 2010 | China | avian | KC990543 |
| BZ 2010 | 2010 | China | avian | KC990540 |
| Shandong1 | 2010 | China | avian | JX965381 |
| JS/2010 | 2010 | China | avian | JX273153 |
| duck/WR/China/2010 | 2010 | China | avian | JX196334 |
| FJMH220 | 2010 | China | avian | JQ928189 |
| GS-PT-7 | 2010 | China | avian | JQ627864 |
| CK-SD-11 | 2010 | China | avian | JQ627862 |
| XHZD/2010 | 2010 | China | avian | JQ595407 |
| ZJ GH-2 | 2010 | China | avian | JQ314465 |
| ZJ 407 | 2010 | China | avian | JQ314464 |
| CJD05 | 2010 | China | avian | JF926699 |
| JS804 | 2010 | China | avian | JF895923 |
| ZJ-6 | 2010 | China | avian | JF459991 |
| BYD-1 | 2010 | China | avian | JF312912 |
| YY5 | 2010 | China | avian | JF270480 |
| TMUV-YY1Du | 2010 | China | avian | AB917088 |
| TC2B | 2011 | China | avian | MH764605 |
| HB201102 | 2011 | China | avian | KY623427 |
| JS201101 | 2011 | China | avian | KY623426 |
| JS201102 | 2011 | China | avian | KY623425 |
| SD201147 | 2011 | China | avian | KY623424 |
| SD201120 | 2011 | China | avian | KY623423 |
| SD201151 | 2011 | China | avian | KY623421 |
| HB201101 | 2011 | China | avian | KY623416 |
| NCLT230 | 2011 | China | avian | KX977554 |
| ZJLJS71 | 2011 | China | avian | KX977553 |
| FJFQ300 | 2011 | China | avian | KX977551 |
| GD06 | 2011 | China | avian | KX977550 |
| FS-2011 | 2011 | China | avian | KX686578 |
| SDSG | 2011 | China | avian | KJ740746 |
| GX 2011 | 2011 | China | avian | KC990542 |
| DU/CH/LSD/110128 F10 | 2011 | China | avian | KC800808 |
| Du/CH/LSD/110128 | 2011 | China | avian | KC136210 |
| JM | 2011 | China | avian | JN811559 |
| FS | 2011 | China | avian | JN811558 |
| GX2012 | 2012 | China | avian | MN649264 |

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|----------------------|------|----------|----------|----------|
| HB201214 | 2012 | China | avian | KY623420 |
| HB201217 | 2012 | China | avian | KY623419 |
| D1921/1/3/MY | 2012 | Malaysia | avian | KX097990 |
| D1977/1/MY | 2012 | Malaysia | avian | KX097989 |
| YN12193 | 2012 | China | Mosquito | KT607936 |
| YN12115 | 2012 | China | Mosquito | KT607935 |
| xz 2012 | 2012 | China | avian | KM188953 |
| DTMUV-AH2011 | 2012 | China | avian | KJ958533 |
| Du/CH/LSD/110128 P90 | 2012 | China | avian | KJ782380 |
| Du/CH/LSD/110128 P70 | 2012 | China | avian | KJ782379 |
| Du/CH/LSD/110128 P50 | 2012 | China | avian | KJ782378 |
| Du/CH/LSD/110128 P30 | 2012 | China | avian | KJ782377 |
| df-2 | 2012 | China | avian | KJ489355 |
| TMUV-SDHS | 2012 | China | avian | KF826767 |
| zc-1 | 2012 | China | avian | KF557894 |
| lq-1 | 2012 | China | avian | KF557893 |
| WFZ 2012 | 2012 | China | avian | KC990545 |
| FX 2012 | 2012 | China | avian | KC990541 |
| SDMS | 2012 | China | Mosquito | KC333867 |
| WJ-1 | 2012 | China | avian | JX549382 |
| TMUV-JSGo | 2012 | China | avian | AB917090 |
| TMUV-WZDu | 2012 | China | avian | AB917089 |
| BJ2013 | 2013 | China | avian | MN649265 |
| HD1-2013 | 2013 | China | avian | KX686577 |
| PY-2013 | 2013 | China | avian | KX686576 |
| HD2-2013 | 2013 | China | avian | KX686575 |
| DK/TH/CU-1 | 2013 | Thailand | avian | KR061333 |
| GX2013C | 2013 | China | avian | KP861859 |
| TMUV-SH001 | 2013 | China | avian | KP742476 |
| GX2013G | 2013 | China | avian | KM275941 |
| GX2013E | 2013 | China | avian | KM275940 |
| CQW1 | 2013 | China | avian | KM233707 |
| SX1 | 2013 | China | avian | KM066945 |
| AHQY | 2013 | China | avian | KJ740748 |
| SDLC | 2013 | China | avian | KJ740747 |
| SDXT | 2013 | China | avian | KJ740745 |
| GX2013H | 2013 | China | avian | KJ700462 |
| AH2014 | 2014 | China | avian | MN649267 |
| SD14 | 2014 | China | avian | MH748542 |
| HZ-2014 | 2014 | China | avian | KX686580 |
| PY-2014 | 2014 | China | avian | KX686573 |
| MC | 2014 | China | avian | KX452096 |
| GD2014 | 2014 | China | avian | KU323595 |
| G23 | 2014 | China | avian | KT239021 |

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|----------------------------|------|----------|----------|----------|
| GDHD2014-3 | 2014 | China | avian | KT159713 |
| TMUV-JS06 | 2014 | China | avian | KR869106 |
| DTMUV/CH/2014 | 2014 | China | avian | KP096415 |
| GX2015 | 2015 | China | avian | MN649263 |
| HN2015 | 2015 | China | avian | MN649261 |
| DK/TH/CU-1 | 2015 | Thailand | Mosquito | MH460536 |
| zjYY150903 | 2015 | China | avian | MF522176 |
| zjYY150901 | 2015 | China | avian | MF522174 |
| zjYY150902 | 2015 | China | avian | MF522175 |
| DTMUV JS-S2/2015 | 2015 | China | avian | KY810819 |
| DTMUV JS-S1/2015 | 2015 | China | avian | KY810818 |
| JS-L1/2015 | 2015 | China | avian | KY626659 |
| JS201502 | 2015 | China | avian | KY623441 |
| ZJ201508 | 2015 | China | avian | KY623440 |
| ZJ201506 | 2015 | China | avian | KY623439 |
| ZJ201507 | 2015 | China | avian | KY623438 |
| ZJ201505 | 2015 | China | avian | KY623437 |
| ZJ201503 | 2015 | China | avian | KY623436 |
| ZJ201501 | 2015 | China | avian | KY623435 |
| ZJ201502 | 2015 | China | avian | KY623433 |
| ZJ201504 | 2015 | China | avian | KY623432 |
| AH201501 | 2015 | China | avian | KY623431 |
| AH201502 | 2015 | China | avian | KY623430 |
| AH201504 | 2015 | China | avian | KY623429 |
| JS201501 | 2015 | China | avian | KY623428 |
| HZ3-2015 | 2015 | China | avian | KX686579 |
| HZ2-2015 | 2015 | China | avian | KX686574 |
| HD-2015 | 2015 | China | avian | KX686572 |
| HZ4-2015 | 2015 | China | avian | KX686571 |
| HZ1-2015 | 2015 | China | avian | KX686570 |
| GDLH01 | 2015 | China | avian | KT824876 |
| HB2016 | 2016 | China | avian | MN649266 |
| SDDZ | 2016 | China | avian | MH764606 |
| NMCF | 2017 | China | avian | MH764607 |
| DTMUV/QY/17 | 2018 | China | avian | MT447092 |
| GA | 2018 | China | avian | MK907880 |
| P4 | 2019 | China | avian | MZ574097 |
| SCS01 | 2019 | China | avian | MW143073 |
| WS12101 | 2019 | China | avian | MT951413 |
| DTMUV/Goose/CHN/2019/AQ-19 | 2019 | China | avian | MT708901 |
| H | 2019 | China | avian | MT108702 |
| CHN-YC | 2019 | China | avian | MN966680 |
| CHN-JL | 2019 | China | avian | MN966679 |

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|---------------|-------------|--------------|-----------------|-----------------|
| TP1906 | 2019 | China | Mosquito | MN747003 |
| GL | 2019 | China | avian | MK889501 |
| Y | 2019 | China | avian | MK542820 |
| NTUC225/20 | 2020 | China | avian | MW821486 |
| BZ0162 | 2020 | China | avian | MT951412 |
| YN2020 | 2020 | China | Mosquito | OQ238827 |
