

Supplementary material

Supplementary Table S1. Characteristics of the 138 sequences available in GenBank were used in this study to determine the consensus sequence.

| No. | Access number | Country | Strain | Year | Isolation source/Host |
|-----|---------------|----------|-------------------------------------|------|-----------------------|
| 1 | AXP32225.1 | China | HNZK-04 | 2018 | Swine |
| 2 | AXP32218.1 | China | HNZK-02 | 2018 | Swine |
| 3 | AXP32232.1 | China | HNZK-06 | 2018 | Swine |
| 4 | ALA13747.1 | China | PDCoV/CHJXNI2/2015 | 2015 | Swine |
| 5 | ASK86336.1 | China | CH/JXJGS01/2016 | 2016 | Piglet |
| 6 | ASK86343.1 | China | CH/JXJGS02/2016 | 2016 | Piglet |
| 7 | QBQ34483.1 | China | CH/JXJGS01/2016 | 2016 | Swine |
| 8 | QBQ34490.1 | China | CH/JXJGS01/2016 | 2016 | Swine |
| 9 | QBQ34497.1 | China | CH/JXJGS01/P50 | 2016 | Swine |
| 10 | QFU80843.1 | China | CHN-JS-2017 | 2017 | <i>Sus scrofa</i> |
| 11 | ATJ00131.1 | China | HB-BD-1 | 2017 | Swine |
| 12 | AHM88402.1 | USA | USA/IA/2014/8734 | 2014 | Swine |
| 13 | AIA60975.1 | USA | IL2768 | 2014 | Swine |
| 14 | AIA60982.1 | USA | SD3424 | 2014 | Swine |
| 15 | AIA60989.1 | USA | KY4813 | 2014 | Swine |
| 16 | AIA60996.1 | USA | PA3148 | 2014 | Swine |
| 17 | AIA61003.1 | USA | NE3579 | 2014 | Swine |
| 18 | AIA99520.1 | USA | MI6148 | 2014 | Swine |
| 19 | AIT11902.1 | Korea | KNU14-04 | 2014 | Feces |
| 20 | AKA97940.1 | USA | USA/IL/2014/026PDV P11 | 2015 | |
| 21 | ALJ32187.1 | USA | OH11846 | 2015 | Swine |
| 22 | AQT34132.1 | Korea | DH1 | 2017 | Swine |
| 23 | AQT34138.1 | Korea | DH2 | 2017 | Porcine |
| 24 | ARJ31776.1 | Korea | KNU16-07 | 2017 | Feces |
| 25 | QNT22076.1 | China | CHzmd2019 | 2019 | <i>Sus scrofa</i> |
| 26 | AWV96582.1 | China | CHN/QH/2017/1 | 2017 | Feces |
| 27 | AWV96568.1 | China | CHN/GS/2016/2 | 2016 | Feces |
| 28 | AWV96575.1 | China | CHN/GS/2017/1 | 2017 | Feces |
| 29 | AWV96561.1 | China | CHN/GS/2016/1 | 2016 | Feces |
| 30 | QDF21513.1 | China | CHN/Sichuan/2017 | 2017 | Small intestine |
| 31 | ALT00614.1 | China | LN-DL-2014 | 2014 | Small intestine |
| 32 | ATV90796.1 | China | CHN-GD16-03 | 2016 | Swine |
| 33 | QHI08613.1 | China | CH/GX/1468B/2017 | 2017 | intestinal content |
| 34 | QEX51275.1 | China | CHN-XA18-35 | 2018 | Swine |
| 35 | AML40897.1 | USA | USA/Minnesota292/2014 | 2014 | Swine |
| 36 | ATP16465.1 | Vietnam | P29 15 VN 1215 | 2015 | Swine |
| 37 | AML40806.1 | USA | USA/Indiana453/2014 | 2014 | Swine |
| 38 | QDH76190.1 | China | CHN-SC2015 | 2015 | <i>Sus scrofa</i> |
| 39 | QGZ00527.1 | China | CHN/Sichuan/2019 | 2019 | Small intestine |
| 40 | QDP14513.1 | China | CHN/Sichuan/2017 1 | 2017 | Feces |
| 41 | QDH76196.1 | China | SCNC201705 | 2017 | <i>Sus scrofa</i> |
| 42 | ATU88975.1 | China | CHN-SC2015 2 | 2016 | Swine |
| 43 | ASY98689.1 | China | CHN-HG-2017 | 2017 | <i>Sus scrofa</i> |
| 44 | ANK58280.1 | Thailand | P24 15 NT1 1215/PDCoV/2015/Thailand | 2015 | intestine |
| 45 | APC23093.1 | Thailand | NT1 1215 | 2015 | intestine |
| 46 | AMW88199.1 | Thailand | TT 1115 | 2015 | intestine |
| 47 | APC23094.1 | Thailand | BTL 0116 | 2016 | Swine |
| 48 | ANK58273.1 | Thailand | P2 13 ST2 0313/PDCoV/0213/Thailand | 2013 | Swine |
| 49 | AOM53029.1 | Laos | P1 16 BTL 0115/PDCoV/2016/Lao | 2016 | Small intestine |
| 50 | ANK58266.1 | Thailand | P1 13 ST1 0213/PDCoV/0213/Thailand | 2013 | intestine |
| 51 | AMN91623.1 | Thailand | PDCoV/Swine/Thailand/S5011/2015 | 2015 | Jejunum |
| 52 | AMN91629.1 | Thailand | PDCoV/Swine/Thailand/S5012/2015 | 2015 | Jejunum |
| 53 | AMN91635.1 | Thailand | PDCoV/Swine/Thailand/S5013/2015 | 2015 | Feces |
| 52 | AMN91641.1 | Thailand | PDCoV/Swine/Thailand/S5014J/2015 | 2015 | Jejunum |

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| 55 | AMN91672.1 | Thailand | PDCoV/Swine/Thailand/S5015L/2015 | 2015 | Swine |
| 56 | AMN91684.1 | Thailand | PDCoV/Swine/Thailand/S5018/2015 | 2015 | Blood |
| 57 | AMN91690.1 | Thailand | PDCoV/Swine/Thailand/S5019/2015 | 2015 | Blood |
| 58 | AMN91696.1 | Thailand | PDCoV/Swine/Thailand/S5022/2015 | 2015 | Feces |
| 59 | AMN91708.1 | Thailand | PDCoV/Swine/Thailand/S5024/2015 | 2015 | Feces |
| 60 | AMN91714.1 | Thailand | PDCoV/Swine/Thailand/S5025/2015 | 2015 | Feces |
| 61 | QBF80903.1 | Vietnam | P19 16 VN 0416 | 2016 | intestine |
| 62 | QFU80843.1 | China | CHN-JS-2017 | 2017 | <i>Sus scrofa</i> |
| 63 | QCO76965.1 | China | Swine/CHN/SC/2018/1 | 2018 | Small intestine |
| 64 | QDP14520.1 | China | CHN/Sichuan/2018 | 2018 | Small intestine |
| 65 | QOP74992.1 | China | HeN/swine/2015 | 2015 | Fence |
| 66 | ASR75152.1 | China | SD | 2014 | Feces |
| 67 | AUH28252.1 | China | SHJS/SL/2016 | 2016 | Swine |
| 68 | AVZ61084.1 | China | CHN-HeB1-2017 | 2017 | <i>Sus scrofa</i> |
| 69 | QIV13101.1 | China | CHN-GX09-2018 | 2018 | Swine |
| 70 | QDO79111.1 | China | CHN-GX01-2018 | 2018 | Swine |
| 71 | QIV13081.1 | China | CHN-GX11-2018 | 2018 | Swine |
| 72 | QIV13088.1 | China | CHN-GX12-2018 | 2018 | Swine |
| 73 | QIV13094.1 | China | CHN-GX81-2018 | 2018 | Swine |
| 74 | AUG59166.1 | China | CH/Jiangsu/2014 | 2014 | Feces |
| 75 | ATV90800.1 | China | CHN-GD16-05 | 2016 | Swine |
| 76 | AKC54430.1 | China | CHN-AH-2004 | 2004 | Swine |
| 77 | APW35736.1 | China | HB-BD-2 | 2016 | Swine |
| 78 | APG38200.1 | China | CHN/Tianjin/2016 | 2016 | Feces |
| 79 | AVR48521.1 | China | CHN-GD-2016 | 2016 | LLC-PK cells |
| 80 | AYU65234.1 | China | PDCoV/CHGD/2016 | 2016 | Swine |
| 81 | QWE80494.1 | Haiti | PDCoV/Haiti/Human/0081-4/2014 | 2014 | <i>Homo sapiens</i> |
| 82 | QWE80510.1 | Haiti | PDCoV/Haiti/Human/0329-4/2015 | 2015 | <i>Homo sapiens</i> |
| 83 | AQS99155.1 | China | CH-01 | 2016 | |
| 84 | AUG59158.1 | China | CH/Hunan/2014 | 2014 | Feces |
| 85 | AKQ63085.1 | China | CH/Sichuan/S27/2012 | 2017 | Feces |
| 86 | QUM93289.1 | China | HNZK-04-P5 | 2018 | Swine |
| 87 | QUM93296.1 | China | HNZK-04-P15 | 2018 | Swine |
| 88 | AKC54444.1 | China | CHN-JS-2014 | 2014 | Feces |
| 89 | ALD83758.1 | China | CH/SXD1/2015 | 2015 | Swine |
| 90 | AYP31080.1 | China | CHN-HN-1601 | 2016 | Feces |
| 91 | AML83918.1 | China | CHN-LYG-2014 | 2014 | Feces |
| 92 | AML40778.1 | USA | USA/Minnesota442/2014 | 2014 | Swine |
| 93 | AML40785.1 | USA | USA/Minnesota214/2014 | 2014 | Swine |
| 94 | AML40883.1 | USA | USA/Ohio444/2014 | 2014 | Swine |
| 95 | AML40890.1 | USA | USA/Ohio445/2014 | 2014 | Swine |
| 96 | ANI85827.1 | USA | PDCoV/USA/Iowa136/2015 | 2015 | Feces |
| 97 | ANI85834.1 | USA | PDCoV/USA/Minnesota140/2015 | 2015 | Feces |
| 98 | ANI85841.1 | USA | PDCoV/USA/Nebraska137/2015 | 2015 | Feces |
| 99 | ANI85848.1 | USA | PDCoV/USA/Nebraska145/2015 | 2015 | Feces |
| 100 | AML40855.1 | USA | USA/NorthCarolina452/2014 | 2014 | Swine |
| 101 | BAZ95611.1 | Japan | HKD/JPN/2016 | 2016 | <i>Sus scrofa</i> |
| 102 | APC23097.1 | Thailand | VN 1 1215 | 2015 | intestine |
| 103 | AML40904.1 | USA | USA/Iowa459/2014 | 2014 | Swine |
| 104 | BBA66307.1 | Japan | AKT/JPN/2014 | 2014 | <i>Sus scrofa domesticus</i> |
| 105 | BBA66328.1 | Japan | IWT/JPN/2014 | 2014 | <i>Sus scrofa domesticus</i> |
| 106 | AML40869.1 | USA | USA/Nebraska209/2014 | 2014 | Swine |
| 107 | AML40876.1 | USA | USA/Nebraska210/2014 | 2014 | Swine |
| 110 | AML40862.1 | USA | USA/Minnesota159/2014 | 2014 | Swine |
| 111 | AML40841.1 | USA | USA/Illinois272/2014 | 2014 | Swine |
| 112 | AML40848.1 | USA | USA/Illinois273/2014 | 2014 | Swine |
| 113 | AML40606.1 | USA | USA/Arkansas61/2015 | 2015 | Swine |
| 114 | AML40792.1 | USA | USA/Michigan447/2014 | 2014 | Swine |
| 115 | AML40799.1 | USA | USA/Michigan448/2014 | 2014 | Swine |
| 116 | AML40813.1 | USA | USA/Illinois449/2014 | 2014 | Swine |
| 117 | AML40820.1 | USA | USA/Minnesota/2013 | 2013 | Swine |
| 118 | AML40827.1 | USA | USA/Minnesota454/2014 | 2014 | Swine |
| 119 | AML40834.1 | USA | USA/Minnesota455/2014 | 2014 | Swine |
| 120 | ASS83088.1 | South Korea | KNU16-11 | 2016 | Feces |
| 121 | BBA66314.1 | Japan | GNM-1/JPN/2014 | 2014 | <i>Sus scrofa domesticus</i> |
| 122 | BBA66321.1 | Japan | GNM-2/JPN/2014 | 2014 | <i>Sus scrofa domesticus</i> |

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|-----|----------------|-------------|---------------------------------|------|------------------------------|
| 123 | BBA66335.1 | Japan | MYZ/JPN/2014 | 2014 | <i>Sus scrofa domesticus</i> |
| 124 | BBA66342.1 | Japan | OKN/JPN/2014 | 2014 | <i>Sus scrofa domesticus</i> |
| 125 | BBA66349.1 | Japan | YMG/JPN/2014 | 2014 | <i>Sus scrofa domesticus</i> |
| 126 | QWE80502.1 | Haiti | PDCoV/Haiti/Human/0256-1/2015 | 2015 | <i>Homo sapiens</i> |
| 127 | AWG96867.1 | South Korea | KNU16-07-P5 | 2016 | Swine |
| 128 | AWG96880.1 | South Korea | KNU16-07-P20 | 2016 | Swine |
| 129 | QPI70914.1 | USA | USA/IL/2014/026PDV P11 3 | 2019 | Swine |
| 130 | AKC54437.1 | China | CHN-HB-2014 | 2014 | Feces |
| 131 | ALT00617.1 | China | SD-QD23-2014 | 2014 | Feces |
| 132 | ALT00620.1 | China | TJN2-2014 | 2014 | Feces |
| 133 | APZ76692.1 | China | PDCoV/Swine/Vietnam/HaNoi6/2015 | 2015 | Feces |
| 134 | ALT00612.1 | China | HLJ-HH-2014 | 2014 | small intestinal |
| 135 | ALT00615.1 | China | SD-QD3-2014 | 2014 | Boar feces |
| 136 | ALS54088.1 | China | CHN-HN-2014 | 2014 | <i>Sus scrofa</i> |
| 137 | AHN16222.1 | China | OH1987 | 2014 | Swine |
| 138 | YP_009513023.1 | China | HKU15 | 2012 | Swine |