Table S 1 Full details of the datasets used in the study.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Genome Type** | **Virus Family** | **Virus Genus** | **Virus Species** | **Dataset Name** |
| ssDNA | Circoviridae | Circovirus | Beak and feather disease virus | BFDV |
| Duck circovirus, Goose circovirus | DG\_CV |
| Columbine circovirus | PiCV |
| Circovirus | CCCC |
| Bat circovirus | BTC |
| Porcine Circovirus 2 | POCV2 |
| Cyclovirus | CCV |
| Geminiviridae | Begomovirus | East Africa cassava mosaic virus, South African cassava mosaic virus | Begomo6 |
| Tomato yellow leaf curl virus | Begomo5 |
| Malvastrum yellow vein Yunnan virus, Cotton leaf curl Multan virus, Bhendi yellow vein India virus | Begomo9 |
| Tobacco yellow dwarf virus, Chickpea chlorosis virus, Chickpea yellows virus | Dicot\_1 |
| Mastrevirus | Chickpea chlorotic dwarf virus | Dicot\_2 |
| Maize streak virus | MSV |
| Panicum streak virus | PanSV |
| Wheat dwarf virus | WDV |
| Anelloviridae | Annellovirus | Torque teno virus 1 | TTV\_1 |
| Torque teno sus virus | TTSV |
| Parvoviridae | Aneptorquevirus | minute virus of mice, MVM | MVM |
| Protoparvovirus | Human parvovirus | HPV |
| Canine parvovirus | CPV |
| porcine parvovirus | PPV |
| Amdoparvovirus | Carnivore amdoparvovirus | CAV\_P |
| Nanoviridae | Babuvirus | Banana bunchy top virus | BBTV\_M |
| BBTV\_N |
| BBTV\_R |
| BBTV\_S |
| Nanovirus | Coconut foliar decay virus | CCDV |
| Milk vetch dwarf virus full genome | MDV |
| Pea necrotic yellow dwarf virus | PYDV |
| Faba bean necrotic stunt virus | FBNS |
| Microviridae | Microviruses | Microvirus | BMV |
| Pleolipoviridae | Pleolipoviruses | Betapleolipovirus | BPV |
| Alphapleolipovirus | APV |
| ssRNA | Astroviridae | Astroviruses | Human astrovirus | HAV |
| Bovine astrovirus | BAV |
| Mamastrovirus | MMV |
| porcine astrovirus | PAV |
| chicken astrovirus | CKV |
| Goose astrovirus | GA |
| Canine astrovirus | CAV\_A |
| Bromoviridae | Cucumovirus | Cucumber mosaic virus | CMV\_RNA1 |
| CMV\_RNA2 |
| CMV\_RNA3 |
| Alphamovirus | Alphalfa mosaic virus | AMS |
| Cucumovirus | Peanut stunt virus | PSV |
| Caliciviridae | Lagovirus | Lagovirus | LAV |
| coroviruses | Norovirus | NoV |
| Vesivirus | Vesivirus | VSV |
| Closteroviridae | Closterovirus | Citrus tristeza virus | CTV |
| Flaviviridae | Flavivirus | Dengue virus | DGV\_T1 |
| Japanese encephalitis virus | JEV |
| Hepeviridae | Hepevirus | Hepatitis E virus | HPVE1 |
| Hepatitis E2 virus | HPVE2 |
| Picornaviridae | Enterovirus | Human Rhinovirus A | HRV\_A |
| Enterovirus A | ENV\_A |
| Teschovirus | Techovirus | TCV |
| Aichivirus | Aichivirus | AiV |
| Aphthovirus | Foot and mouth disease virus | FMDV |
| Avihepatovirus | AHP |
| Cardiovirus | Encephalomyo carditis virus | ECV |
| Cardiovirus | CDV |
| Fusariviridae | Fusarivirus | Fusariviruses | FRV |
| Retroviridae | Lentivirus | Human immuno-deficiency virus 1 | HIV1\_setA |
| HIV1\_M |
| HIV1\_setC |
| HIV1\_setD |
| HIV1\_setE |
| HIV1\_setF |
| Simian immuno-deficiency virus | SIV |
| Bovine immunodeficiency | BIV |
| Feline immunodeficiency | FIV |
| equine infectious anemia virus | EIV |
| caprine arthritis encephalitis virus | CAV |
| Orthomyxo-viridae | Influenzavirus | Influenza virus A | FluA\_2 |
| Influenza virus B | FluB\_1 |
| Filoviridae | Ebolavirus | Ebola virus | Ebola\_2 |
| Coronaviridae | Merbecovirus | Middle East respiratory syndrome | MERS-COV |
| Sarbecoviruses | Severe acute respiratory syndrome coronavirus 1 | SARS-COV1 |
| Severe acute respiratory syndrome coronavirus 2 | SARS-COV2 |
| sarbecoviruses | SARB |
| dsDNA | Papillomaviridae | Alphapapillomavirus | Alphapapillomavirus 6 | APPV 6 |
| Alphapapillomavirus 7 | HPV18\_2 |
| HPV45\_2 |
| Alphapapillomavirus 9 | HPV16\_2 |
| HPV31 |
| Alphapapillomavirus 10 | HPV6\_1 |
| Bovine papillomavirus | BPV |
| Lambdaapapillomavirus | LPV |
| Deltapapillomavirus | DPV |
| Xipapillomavirus | XPV |
| Polyomaviridae | Polyomavirus | BK polyomavirus | BK\_2 |
| JC polyomavirus | JC\_2 |
| Bat polyomavirus | BPV |
| Simian virus 40 | SMV\_40 |
| Caulimoviridae | Caulimovirus | cauliflower mosaic virus | CMV |
| Cacao swollen shoot virus | CSSV |
| Strawberry vein banding virus | SVBV |
| Dioscorea bacilliform AL virus | DBAV |
| Rice tungro bacilliform virus | RTBV |
| badnavirus | BDV |
| Siphoviridae | Escherichia virus Lambda | coliphage lambda | CLV |
| [Tectiviridae](http://www.virology.net/big_virology/BVDNAtecti.html) | Tectivirus | Tectivirus | TTIV |
| [Adenoviridae](http://www.virology.net/big_virology/BVDNAadeno.html) | Aviadenovirus | Fowl aviadenovirus C | FAV\_C |
| Fowl aviadenovirus E | FAV\_E |
| Fowl aviadenovirus A | FAV\_A |
| Fowl aviadenovirus D | FAV\_D |
|  | Mastadenovirus | Human mastadenovirus B | HMAV\_B |
| Human mastadenovirus D | HMAV\_D |
| Human mastadenovirus C | HMAV\_C |
| Human mastadenovirus E | HMAV\_E |
| DsRNA | Birnaviridae | Avibirnavirus | Gumburo virus\_setA | GBV\_A |
| Gumburo virus\_setB | GBV\_B |
| Aquabirnavirus | Infectious pancreatic necrosis virus | IPNV |
| Aquabirnavirus | AQBV |
| Reoviridae | Orbivirus | Bluetongue\_virus\_setA | BTV\_A |
| Bluetongue\_virus\_setB | BTV\_B |
| Bluetongue\_virus\_setC | BTV\_C |
| Bluetongue\_virus\_setD | BTV\_D |
| Bluetongue\_virus\_setF | BTV\_F |
| Bluetongue\_virus\_setG | BTV\_G |
| Bluetongue\_virus\_setH | BTV\_H |
| Bluetongue\_virus\_setI | BTV\_I |
| Rotavirus | Bovine\_rotavirus\_A\_setC | BRVA\_C |
| Human\_rotavirus\_A\_setA | HRVA\_A |
| Human\_rotavirus\_A\_setB | HRVA\_B |
| Human\_rotavirus\_A\_setC | HRVA\_C |
| Human\_rotavirus\_A\_setD2 | HRVA\_D2 |
| Human\_rotavirus\_A\_setE | HRVA\_E |
| Human\_rotavirus\_A\_setF | BRVA\_F |
| Human\_rotavirus\_A\_setG | HRVA\_G |
| Human\_rotavirus\_A\_setH | HRVA\_H |
| Porcine\_rotavirus\_A\_setA | PRVA\_A |
| Porcine\_rotavirus\_A\_setB | PRVA\_B |
| Human\_rotavirus\_C\_setA | HRVC\_A |
| Orthoreovirus | Pteropine orthoreovirus | PTOV |
| Fijivirus | Fijivirus\_setB | FJV\_B |
| Totiviridae | Totivirus | Totivirus | TTV |
| Giardiavirus | Giardiavirus | GDV |
| Hypoviridae | Hypovirus | Hypovirus | HPV |
| Endornaviridae | Endornavirus | Endornavirus | EDV |
| Alphaendornavirus | Bell pepper alphaendornavirus | BPAV |