**Table S3.** The locus\_tag/protein ID of 44 ranavirues core genes

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  |  | ADRV-KC865735 | ATV-AY150217 | BIV-KX185156 | CGSIV-KF033124 | CGSIV-KF512820 | CH8/96-KP266741 | CMTV-JQ231222 | CMTV-KP056312 | CoIV-KX574342 | EHNV-FJ433873 | ESV-JQ724856 | FV3-AY548484 | FV3-KJ175144 | GGRV-KP266742 | GIV-AY666015 | PEV-MF538627 | PPIV-KX574341 | RCV-Z2-MF187209 | RCV-Z-MF187210 | REV-MF538628 | RGV-JQ654586 | Rmax-KX574343 | RNRV-MG791866 | SERV-KX353311 | SGIV-AY521625 | STIV-EU627010 | TCA-MG953518 | TFV-AF389451 | TMRV01-MG953519 | TMRV02-MG953520 | ToRV-KP266743 | ZRV-MK227779 |
| Cluster1\* | Replicating factor | ORF1R | AAP33272.1 | ORF1 | 1R | 001R | ORF1R | 1R | 1R | ANZ57028.1 | 100R | 132R | orf1R | orf1R | ORF1R | ORF1R | GIV67 | ORF1 | ANZ56919.1 | ORF1 | ORF1 | ORF1 | ANZ57126.1 | ORF1R | ORF1 | ORF116R | ORF001R | ORF1 | ORF105R | ORF1 | ORF1 | ORF1R | ORF001 |
| Cluster2 | Unknown | ORF4R | AAP33180.1 | ORF4 | 4R | 004R | ORF4R | 4R | 4R | ANZ57031.1 | 3R | 3R | orf3R | orf3R | ORF4R | ORF4R | GIV02 | ORF4 | ANZ56922.1 | ORF4 | ORF4 | ORF4 | ANZ57129.1 | ORF4R | ORF4 | ORF016L | ORF005R | ORF4 | ORF004R | ORF4 | ORF4 | ORF4R | ORF004 |
| Cluster3 | Unknown | ORF20R | AAP33194.1 | ORF90 | 20R | 022R | ORF17R | 19R | 19R | ANZ57044.1 | 17R | 25R | orf87L | orf87L | ORF64L | ORF94L | GIV36 | ORF21 | ANZ56936.1 | ORF19 | ORF21 | ORF21 | ANZ57142.1 | ORF94L | ORF19 | ORF069L | ORF093L | ORF85 | ORF093L | ORF85 | ORF85 | ORF17R | ORF085 |
| Cluster4\* | Immediate early protein | ORF16L | AAP33190.1 | ORF94 | 16L | 018L | ORF13L | 15L | 15L | ANZ57040.1 | 13L | 21L | orf91R | orf91R | ORF68R | ORF98R | GIV90 | ORF17 | ANZ56932.1 | ORF15 | ORF17 | ORF17 | ANZ57138.1 | ORF98R | ORF15 | ORF162L | ORF097R | ORF89 | ORF097R | ORF89 | ORF89 | ORF13L | ORF089 |
| Cluster5\* | P8.141C-like protein | ORF13R | AAP33188.1 | ORF96 | 14R | 015R | ORF11R | 13R | 13R | ANZ57038.1 | 11R | 18R | orf94L | orf94L | ORF70L | ORF101L | GIV56 | ORF14 | ANZ56930.1 | ORF12 | ORF14 | ORF14 | ANZ57136.1 | ORF101L | ORF13 | ORF098R | ORF099L | ORF91 | ORF100L | ORF91 | ORF91 | ORF11R | ORF091 |
| Cluster6\* | DNA repair protein RAD2 | ORF12L | AAP33187.1 | ORF97 | 13L | 014L | ORF10L | 12L | 12L | ANZ57037.1 | 10L | 17L | orf95R | orf95R | ORF71R | ORF102R | GIV55 | ORF13 | ANZ56929.1 | ORF11 | ORF13 | ORF13 | ANZ57135.1 | ORF102R | ORF12 | ORF097L | ORF100R | ORF92 | ORF101R | ORF92 | ORF92 | ORF10L | ORF092 |
| Cluster7 | Unknown | ORF18L | AAP33192.1 | ORF92 | 18L | 020L | ORF15L | 17L | 17L | ANZ57042.1 | 15L | 23L | orf89R | orf89R | ORF66R | ORF96R | GIV38 | ORF19 | ANZ56934.1 | ORF17 | ORF19 | ORF19 | ANZ57140.1 | ORF96R | ORF17 | ORF071R | ORF095R | ORF87 | ORF095R | ORF87 | ORF87 | ORF15L | ORF087 |
| Cluster8\* | Proliferating cell nuclear antigen | ORF23L | AAP33197.1 | ORF87 | 22L | 025L | ORF19L | 22L | 22L | ANZ57047.1 | 19L | 28L | orf84R | orf84R | ORF62R | ORF91R | GIV35 | ORF24 | ANZ56939.1 | ORF22 | ORF24 | ORF24 | ANZ57145.1 | ORF91R | ORF22 | ORF068L | ORF091R | ORF82 | ORF090R | ORF82 | ORF82 | ORF20L | ORF083 |
| Cluster9\* | Deoxynucleoside kinase/thymidine kinase | ORF22L | AAP33196.1 | ORF88 | 21L | 024L | ORF18L | 21L | 21L | ANZ57046.1 | 18L | 27L | orf85R | orf85R | ORF63R | ORF92R | GIV34 | ORF23 | ANZ56938.1 | ORF21 | ORF23 | ORF23 | ANZ57144.1 | ORF92R | ORF21 | ORF067L | ORF092R | ORF83 | ORF091R | ORF83 | ORF83 | ORF19L | ORF084 |
| Cluster10\* | Major capsid protein | ORF17L | AAP33191.1 | ORF93 | 17L | 019L | ORF14L | 16L | 16L | ANZ57041.1 | 14L | 22L | orf90R | orf90R | ORF67R | ORF97R | GIV39 | ORF18 | ANZ56933.1 | ORF16 | ORF18 | ORF18 | ANZ57139.1 | ORF97R | ORF16 | ORF072R | ORF096R | ORF88 | ORF096R | ORF88 | ORF88 | ORF14L | ORF088 |
| Cluster11 | (RNRα)ribonucleotide reductase alpha | ORF71L | AAP33245.1 | ORF40 | 72L | 073L | ORF53L | 69L | 69L | ANZ57101.1 | 73R | 98R | orf38R | orf38R | ORF30R | ORF41R | GIV33 | ORF70 | ANZ56986.1 | ORF56 | ORF69 | ORF71 | ANZ57201.1 | ORF41R | ORF85 | ORF064R | ORF042R | ORF37 | ORF041R | ORF37 | ORF37 | ORF56L | ORF037 |
| Cluster12\* | AAA-ATPase | ORF96L | AAP33264.1 | ORF16 | 95L | 103L | ORF71L | 94L | 94L | ANZ57119.1 | 92L | 120L | orf15R | orf15R | ORF12R | ORF16R | GIV73 | ORF92 | ANZ57011.1 | ORF32 | ORF91 | ORF93 | ANZ57219.1 | ORF16R | ORF105 | ORF134L | ORF016R | ORF14 | ORF016R | ORF14 | ORF14 | ORF72L | ORF015 |
| Cluster13 | Unknown | ORF100R | AAP33270.1 | ORF99 | 100R | 110R | ORF74R | 101R | 101R | ANZ57124.1 | 98R | 130R | orf96R | orf96R | ORF72R | ORF104R | GIV62 | ORF98 | ANZ57017.1 | ORF99 | ORF97 | ORF100 | ANZ57224.1 | ORF104R | ORF110 | ORF111R | ORF102R | ORF93 | ORF103R | ORF93 | ORF93 | ORF75R | ORF094 |
| Cluster14\* | NIF/NLI interacting factor | ORF72L | AAP33244.1 | ORF39 | 73L | 074L | ORF54L | 70L | 70L | ANZ57100.1 | 72R | 97R | orf37R | orf37R | ORF29R | ORF40R | GIV31 | ORF71 | ANZ56987.1 | ORF55 | ORF70 | ORF72 | ANZ57200.1 | ORF40R | ORF84 | ORF061R | ORF041R | ORF36 | ORF040R | ORF36 | ORF36 | ORF57L | ORF036 |
| Cluster15 | Unknown | ORF82L | AAP33238.1 | ORF30 | 82L | 086L | ORF59L | 79L | 79L | ANZ57093.1 | 63R | 86R | orf28R | orf28R | ORF24R | ORF30R | GIV89 | ORF80 | ANZ56996.1 | ORF45 | ORF79 | ORF81 | ANZ57192.1 | ORF30R | ORF73 | ORF160L | ORF032R | ORF27 | ORF030R | ORF27 | ORF27 | ORF60L | ORF028 |
| Cluster16 | p31K protein | ORF85L | AAP33234.1 | ORF27 | 85L | 089L | ORF62L | 82L | 82L | ANZ57090.1 | 60R | 82R | orf25R | orf25R | ORF21R | ORF27R | GIV96 | ORF83 | ANZ56999.1 | ORF42 | ORF82 | ORF84 | ANZ57189.1 | ORF27R | ORF70 | ORF006R | ORF029R | ORF24 | ORF25R | ORF24 | ORF24 | ORF63L | ORF025 |
| Cluster17\* | D5 family NTPase/ATPase | ORF88L | AAP33258.1 | ORF24 | 88L | 092L | ORF65L | 85L | 85L | ANZ57111.1 | 85L | 112L | orf22R | orf22R | ORF18R | ORF24R | GIV27 | ORF86 | ANZ57002.1 | ORF39 | ORF85 | ORF87 | ANZ57211.1 | ORF24R | ORF96 | ORF052L | ORF025R | ORF21 | ORF022R | ORF21 | ORF21 | ORF66L | ORF023 |
| Cluster18 | Unknown | ORF90L | AAP33260.1 | ORF22 | 90L | 095L | ORF67L | 87L | 87L | ANZ57113.1 | 88L | 116L | orf20R | orf20R | ORF16R | ORF22R | GIV16 | ORF88 | ANZ57004.1 | ORF37 | ORF87 | ORF89 | ANZ57213.1 | ORF22R | ORF99 | ORF038L | ORF023R | ORF19 | ORF020R | ORF19 | ORF19 | ORF68L | ORF021 |
| Cluster19\* | Serine threonine protein kinase | ORF91L | AAP33261.1 | ORF21 | 91L | 096L | ORF68L | 88L | 88L | ANZ57114.1 | 89L | 117L | orf19R | orf19R | ORF15R | ORF21R | GIV17 | ORF89 | ANZ57005.1 | ORF36 | ORF88 | ORF90 | ANZ57214.1 | ORF21R | ORF100 | ORF039L | ORF021R | ORF18 | ORF019R | ORF18 | ORF18 | ORF69L | ORF020 |
| Cluster20 | Methyl-accepting chemotaxis sensory transducer | ORF93R | AAP33262.1 | ORF19 | 93R | 099R | ORF69R | 90R | 90R | ANZ57116.1 | 90R | 118R | orf17L | orf17L | ORF14L | ORF19L | GIV19 | ORF90 | ANZ57007.1 | ORF34 | ORF89 | ORF91 | ANZ57216.1 | ORF19L | ORF102 | ORF043R | ORF018L | ORF16 | ORF018L | ORF16 | ORF16 | ORF70R | ORF018 |
| Cluster21 | Helicase-like protein | ORF54R | AAP33229.1 | ORF56 | 56R | 062L | ORF40R | 54R | 54R | ANZ57083.1 | 51R | 71R | orf55L | orf55L | ORF41L | ORF56L | GIV85 | ORF54 | ANZ56971.1 | ORF74 | ORF53 | ORF55 | ANZ57181.1 | ORF56L | ORF59 | ORF152R | ORF057L | ORF53 | ORF056L | ORF53 | ORF53 | ORF44R | ORF052 |
| Cluster22 | dUTPase | ORF44L | AAP33220.1 | ORF67 | 45L | 047L | ORF33L | 44L | 44L | ANZ57071.1 | 42L | 56L | orf63R | orf63R | ORF48R | ORF67R | GIV24 | ORF47 | ANZ56961.1 | ORF84 | ORF44 | ORF47 | ANZ57169.1 | ORF67R | ORF47 | ORF049L | ORF066R | ORF63 | ORF068R | ORF63 | ORF63 | ORF36L | ORF063 |
| Cluster23\* | DNA dependent RNA polymerase II | ORF46R | AAP33221.1 | ORF65 | 47R | 049R | ORF34R | 46R | 46R | ANZ57073.1 | 43R | 58R | orf62L | orf62L | ORF47L | ORF65L | GIV40 | ORF48 | ANZ56963.1 | ORF83 | ORF45 | ORF48 | ANZ57171.1 | ORF65L | ORF49 | ORF073L | ORF064L | ORF62 | ORF65L | ORF62 | ORF62 | ORF37R | ORF061 |
| Cluster24\* | RNase III | ORF28R | AAP33202.1 | ORF83 | 28R | 031R | ORF24R | 27R | 27R | ANZ57052.1 | 24R | 34R | orf80L | orf80L | ORF58L | ORF87L | GIV46 | ORF29 | ANZ56944.1 | ORF26 | ORF29 | ORF29 | ANZ57150.1 | ORF87L | ORF27 | ORF084L | ORF087L | ORF78 | ORF085L | ORF78 | ORF78 | ORF24R | ORF079 |
| Cluster25 | Atpase-dependent protease | ORF29L | AAP33203.1 | ORF82 | 29L | 032L | ORF25L | 28L | 28L | ANZ57053.1 | 25L | 35L | orf79R | orf79R | ORF57R | ORF86R | GIV45 | ORF30 | ANZ56945.1 | ORF27 | ORF30 | ORF30 | ANZ57151.1 | ORF86R | ORF28 | ORF083R | ORF086R | ORF77 | ORF084R | ORF77 | ORF77 | ORF25L | ORF078 |
| Cluster26 | Immediate early protein icp-18 | ORF26L | AAP33200.1 | ORF85 | 26L | 029L | ORF22L | 25L | 25L | ANZ57050.1 | 22L | 32L | orf82R | orf82R | ORF60R | ORF89R | GIV48 | ORF27 | ANZ56942.1 | ORF24 | ORF27 | ORF27 | ANZ57148.1 | ORF89R | ORF25 | ORF086R | ORF089R | ORF80 | ORF087R | ORF80 | ORF80 | ORF22L | ORF081 |
| Cluster27\* | Transcription elongation factor sii | ORF27L | AAP33201.1 | ORF84 | 27L | 030L | ORF23L | 26L | 26L | ANZ57051.1 | 23L | 33L | orf81R | orf81R | ORF59R | ORF88R | GIV47 | ORF28 | ANZ56943.1 | ORF25 | ORF28 | ORF28 | ANZ57149.1 | ORF88R | ORF26 | ORF085R | ORF088R | ORF79 | ORF086R | ORF79 | ORF79 | ORF23L | ORF080 |
| Cluster28\* | RNRβ | ORF42R | AAP33216.1 | ORF70 | 43R | 045R | ORF31R | 40R | 40R | ANZ57068.1 | 38R | 53R | orf67L | orf67L | ORF49L | ORF73L | GIV22 | ORF43 | ANZ56957.1 | ORF86 | ORF42 | ORF43 | ANZ57166.1 | ORF73L | ORF43 | ORF047L | ORF071L | ORF65 | ORF071L | ORF65 | ORF65 | ORF34R | ORF066 |
| Cluster29 | Unknown | ORF31R | AAP33204.1 | ORF80 | 31R | 034R | ORF27R | 30R | 30R | ANZ57056.1 | 27R | 39R | orf77L | orf77L | ORF55L | ORF84L | GIV69 | ORF32 | ANZ56947.1 | ORF96 | ORF32 | ORF32 | ANZ57154.1 | ORF84L | ORF31 | ORF120L | ORF084L | ORF75 | ORF082L | ORF75 | ORF75 | ORF27R | ORF076 |
| Cluster30 | Unknown | ORF34R | AAP33207.1 | ORF77 | 34R | 037R | ORF28R | 33R | 33R | ANZ57059.1 | 30R | 42R | orf74L | orf74L | ORF54L | ORF81L | GIV75 | ORF35 | ANZ56950.1 | ORF93 | ORF35 | ORF35 | ANZ57157.1 | ORF81L | ORF34 | ORF137R | ORF079L | ORF72 | ORF079L | ORF72 | ORF72 | ORF28R | ORF073 |
| Cluster31\* | Unknown | ORF68L | AAP33249.1 | ORF44 | 69L | 069L | ORF50L | 65L | 65L | ANZ57103.1 | 77R | 102R | orf41R | orf41R | ORF33R | ORF44R | GIV29 | ORF66 | ANZ56983.1 | ORF60 | ORF65 | ORF67 | ANZ57203.1 | ORF44R | ORF88 | ORF057L | ORF045R | ORF40 | ORF045R | ORF40 | ORF40 | ORF53L | ORF041 |
| Cluster32 | Unknown | ORF48R | AAP33224.1 | ORF63 | 49R | 051R | ORF36R | 48R | 48R | ANZ57076.1 | 45R | 62R | orf59L | orf59L | ORF45L | ORF62L | GIV70 | ORF50 | ANZ56965.1 | ORF80 | ORF47 | ORF50 | ANZ57174.1 | ORF62L | ORF52 | ORF123L | ORF062L | ORF59 | ORF062L | ORF59 | ORF59 | ORF39R | ORF059 |
| Cluster33\* | DNA polymerase | ORF47L | AAP33223.1 | ORF64 | 48L | 050L | ORF35L | 47L | 47L | ANZ57075.1 | 44L | 61L | orf60R | orf60R | ORF46R | ORF63R | GIV71 | ORF49 | ANZ56964.1 | ORF81 | ORF46 | ORF49 | ANZ57173.1 | ORF63R | ORF51 | ORF128R | ORF063R | ORF60 | ORF063R | ORF60 | ORF60 | ORF38L | ORF060 |
| Cluster34\* | Phosphotransferase serine/threonine protein | ORF51L | AAP33226.1 | ORF59 | 53L | 065R | ORF38L | 51L | 51L | ANZ57080.1 | 48L | 68L | orf57R | orf57R | ORF43R | ORF60R | GIV83 | ORF51 | ANZ56968.1 | ORF77 | ORF50 | ORF52 | ANZ57178.1 | ORF60R | ORF56 | ORF150L | ORF060R | ORF56 | ORF59R | ORF56 | ORF56 | ORF42L | ORF055 |
| Cluster35 | Unknown | ORF61L | AAP33257.1 | ORF52 | 61L | 058R | ORF43L | 58L | 58L | ANZ57110.1 | 84R | 109R | orf51R | orf51R | ORF38R | ORF51R | GIV10 | ORF59 | ANZ56976.1 | ORF70 | ORF58 | ORF60 | ANZ57210.1 | ORF51R | ORF95 | ORF026R | ORF053R | ORF49 | ORF053R | ORF49 | ORF49 | ORF47L | ORF048 |
| Cluster36\* | Myristylated membrane protein | ORF58L | AAP33230.1 | ORF54 | 58L | 060R | ORF41L | 56L | 56L | ANZ57085.1 | 53L | 73L | orf53R | orf53R | ORF40R | ORF53R | GIV49 | ORF57 | ANZ56974.1 | ORF72 | ORF56 | ORF58 | ANZ57183.1 | ORF53R | ORF62 | ORF088L | ORF055R | ORF51 | ORF055R | ORF51 | ORF51 | ORF45L | ORF050 |
| Cluster37 | Unknown | ORF66R | AAP33251.1 | ORF47 | 67R | 067L | ORF48R | 63R | 63R | ANZ57105.1 | 79L | 104L | orf45L | orf45L | ORF35L | ORF46L | GIV06 | ORF64 | ANZ56981.1 | ORF64 | ORF63 | ORF65 | ANZ57205.1 | ORF46L | ORF90 | ORF021L | ORF048L | ORF44 | ORF047L | ORF44 | ORF44 | ORF51R | ORF043 |
| Cluster38 | Unknown | ORF64R | AAP33254.1 | ORF49 | 65R | 055L | ORF46R | 61R | 61R | ANZ57107.1 | 81L | 106L | orf47L | orf47L | ORF36L | ORF48L | GIV08 | ORF62 | ANZ56979.1 | ORF66 | ORF61 | ORF63 | ANZ57207.1 | ORF48L | ORF92 | ORF024L | ORF050L | ORF46 | ORF049L | ORF46 | ORF46 | ORF50R | ORF045 |
| Cluster39\* | Helicase family protein | ORF89R | AAP33259.1 | ORF23 | 89R | 094R | ORF66R | 86R | 86R | ANZ57112.1 | 86R | 113R | orf21L | orf21L | ORF17L | ORF23R | GIV28 | ORF87 | ANZ57003.1 | ORF38 | ORF86 | ORF88 | ANZ57212.1 | ORF23R | ORF97 | ORF054R | ORF024L | ORF20 | ORF021L | ORF20 | ORF20 | ORF67R | ORF022 |
| Cluster40\* | Thiol oxidoreductase | ORF19L | AAP33193.1 | ORF91 | 19L | 021L | ORF16L | 18L | 18L | ANZ57043.1 | 16L | 24L | orf88R | orf88R | ORF65R | ORF95R | GIV37 | ORF20 | ANZ56935.1 | ORF18 | ORF20 | ORF20 | ANZ57141.1 | ORF95R | ORF18 | ORF070R | ORF094R | ORF86 | ORF094R | ORF86 | ORF86 | ORF16L | ORF086 |
| Cluster41\* | NTPase/helicase | ORF10L | AAP33184.1 | ORF11 | 11L | 010L | ORF8L | 9L | 9L | ANZ57035.1 | 8L | 12L | orf9L | orf9L | ORF8L | ORF10L | GIV30 | ORF10 | ANZ56927.1 | ORF8 | ORF10 | ORF10 | ANZ57133.1 | ORF10L | ORF9 | ORF060R | ORF011L | ORF8 | ORF009L | ORF8 | ORF8 | ORF8L | ORF010 |
| Cluster42 | SAP domain | ORF62R | AAP33256.1 | ORF51 | 63R | 057L | ORF44R | 59R | 59R | ANZ57109.1 | 83L | 108L | orf49L | orf49/50L | ORF37L | ORF50L | GIV09 | ORF60 | ANZ56977.2 | ORF68 | ORF59 | ORF61 | ANZ57209.1 | ORF50L | ORF94 | ORF025L | ORF052 | ORF48 | ORF051L | ORF48 | ORF48 | ORF48R | ORF047 |
| Cluster43\* | Tyrosine kinase | ORF83L | AAP33237.1 | ORF29 | 83L | 087L | ORF60L | 80L | 80L | ANZ57092.1 | 62R | 85R | orf27R | orf27R | ORF23R | ORF29 | GIV44 | ORF81 | ANZ56997.1 | ORF44 | ORF80 | ORF82 | ANZ57191.1 | ORF29 | ORF72 | ORF078L/81L | ORF031R | ORF26 | ORF029R | ORF26 | ORF26 | ORF61L | ORF027 |
| Cluster44\* | Myristylated membrane protein | ORF2L | AAP33178.1 | ORF2 | 2L | 002L | ORF2L | 2L | 2L | ANZ57029.1 | 1L | 1L | orf2L | orf2L | ORF2L | ORF2L | GIV04 | ORF2 | ANZ56920.1 | ORF2 | ORF2 | ORF2 | ANZ57127.1 | ORF2L | ORF2 | ORF019R | ORF002L | ORF2 | ORF002L | ORF2 | ORF2 | ORF2L | ORF002 |

The asterisk (\*) indicates iridoviridae Core Genes

The gene positions are represented by locus\_tag or protein ID