

Table S1. Baculoviral genomes analyzed.

	#	Species	Strain/Isolate/Genotype	Acronym	Accession
Alphabaculovirus Group I	1	<i>Antheraea pernyi</i> MNPV	Isolate L2	AnpeMNPV-L2	EF207986
	2	<i>Antheraea pernyi</i> NPV	Isolate Z	AnpeNPV-Z	NC_008035
	3	<i>Antheraea pernyi</i> NPV	Strain Liaoning	AnpeNPV-Li	LC194889
	4	<i>Anticarsia gemmatalis</i> MNPV	Isolate 2D	AgMNPV	NC_008520
	5	<i>Anticarsia gemmatalis</i> MNPV	Isolate 26	AgMNPV-26	KR815455
	6	<i>Anticarsia gemmatalis</i> MNPV	Isolate 27	AgMNPV-27	KR815456
	7	<i>Anticarsia gemmatalis</i> MNPV	Isolate 28	AgMNPV-28	KR815457
	8	<i>Anticarsia gemmatalis</i> MNPV	Isolate 29	AgMNPV-29	KR815458
	9	<i>Anticarsia gemmatalis</i> MNPV	Isolate 30	AgMNPV-30	KR815459
	10	<i>Anticarsia gemmatalis</i> MNPV	Isolate 31	AgMNPV-31	KR815460
	11	<i>Anticarsia gemmatalis</i> MNPV	Isolate 32	AgMNPV-32	KR815461
	12	<i>Anticarsia gemmatalis</i> MNPV	Isolate 33	AgMNPV-33	KR815462
	13	<i>Anticarsia gemmatalis</i> MNPV	Isolate 34	AgMNPV-34	KR815463
	14	<i>Anticarsia gemmatalis</i> MNPV	Isolate 35	AgMNPV-35	KR815464
	15	<i>Anticarsia gemmatalis</i> MNPV	Isolate 36	AgMNPV-36	KR815465
	16	<i>Anticarsia gemmatalis</i> MNPV	Isolate 37	AgMNPV-37	NC_031761
	17	<i>Anticarsia gemmatalis</i> MNPV	Isolate 38	AgMNPV-38	KR815467
	18	<i>Anticarsia gemmatalis</i> MNPV	Isolate 39	AgMNPV-39	KR815468
	19	<i>Anticarsia gemmatalis</i> MNPV	Isolate 40	AgMNPV-40	KR815469
	20	<i>Anticarsia gemmatalis</i> MNPV	Isolate 42	AgMNPV-42	KR815470
	21	<i>Anticarsia gemmatalis</i> MNPV	Isolate 43	AgMNPV-43	KR815471
	22	<i>Autographa californica</i> MNPV	Clone C6	AcMNPV	NC_001623
	23	<i>Autographa californica</i> MNPV	Strain E2	AcMNPV-E2	KM667940
	24	<i>Autographa californica</i> MNPV	Isolate WP10	AcMNPV-WP10	KM609482
	25	<i>Bombyx mandarina</i> NPV	Isolate S1	BomaNPV-S1	NC_012672
	26	<i>Bombyx mandarina</i> NPV	Isolate S2	BomaNPV-S2	JQ071499
	27	<i>Bombyx mori</i> NPV	Isolate T3	BmNPV	NC_001962
	28	<i>Bombyx mori</i> NPV	Strain Cubic	BmNPV-Cub	JQ991009
	29	<i>Bombyx mori</i> NPV	Strain Guangxi	BmNPV-Gua	JQ991011
	30	<i>Bombyx mori</i> NPV	Strain India	BmNPV-Ind	JQ991010
	31	<i>Bombyx mori</i> NPV	Strain Zhejiang	BmNPV-Zhe	JQ991008
	32	<i>Bombyx mori</i> NPV	Isolate C1	BmNPV-C1	KF306215
	33	<i>Bombyx mori</i> NPV	Isolate C2	BmNPV-C2	KF306216
	34	<i>Bombyx mori</i> NPV	Isolate C6	BmNPV-C6	KF306217
	35	<i>Bombyx mori</i> NPV	Strain Brazilian	BmNPV-Bra	KJ186100
	36	<i>Catopsilia pomona</i>	Isolate 416	CapoNPV	NC_030240
	37	<i>Choristoneura fumiferana</i> MNPV		CfMNPV	NC_004778
	38	<i>Choristoneura fumiferana</i> Def MNPV		CfDEFMNPV	NC_005137
	39	<i>Choristoneura murinana</i> NPV	Strain Darmstadt	ChmuNPV	NC_023177
	40	<i>Choristoneura occidentalis</i> NPV	Isolate BC1	ChocNPV	NC_021925

Alphabaculovirus Group II	41	<i>Choristoneura rosaceana</i> NPV	Isolate NB1	ChroNPV	NC_021924
	42	<i>Condylorrhiza vestigialis</i> MNPV		CoveMNPV	NC_026430
	43	<i>Dasychira pudibunda</i> NPV	Isolate ML1	DapuNPV	KP747440
	44	<i>Dendrolimus kikuchii</i> NPV	Strain YN	DekiNPV	JX193905
	45	<i>Epiphyas postvittana</i> NPV		EppoNPV	NC_003083
	46	<i>Hyphantria cunea</i> NPV		HycuNPV	NC_007767
	47	<i>Lonomia obliqua</i> MNPV	Isolate SP/2000	LoobMNPV	KP763670
	48	<i>Maruca vitrata</i> NPV		MaviNPV	NC_008725
	49	<i>Orgyia pseudotsugata</i> MNPV		OpMNPV	NC_001875
	50	<i>Philosamia cynthia ricini</i> NPV		PhcyNPV	JX404026
	51	<i>Plutella xylostella</i> MNPV	Isolate CL3	PlxyMNPV	NC_008349
	52	<i>Rachiplusia ou</i> MNPV		RoMNPV	NC_004323
	53	<i>Thysanoplusia orichalcea</i> NPV	Isolate P2	ThorNPV-P2	NC_019945
	54	<i>Adoxophyes honmai</i> NPV		AdhoNPV	NC_004690
	55	<i>Adoxophyes orana</i> NPV		AdorNPV	NC_011423
	56	<i>Agrotis ipsilon</i> MNPV		AgipMNPV	NC_011345
	57	<i>Agrotis segetum</i> NPV		AgseNPV	NC_007921
	58	<i>Agrotis segetum</i> NPV	B Isolate English	AgseNPV-Beng	NC_025960
	59	<i>Apocheima cinerarium</i> NPV		ApciNPV	NC_018504
	60	<i>Buzura suppressaria</i> NPV	Isolate Hubei	BusuNPV	NC_023442
	61	<i>Buzura suppressaria</i> NPV	Isolate Guangxi	BusuNPV-G	KM986882
	62	<i>Chrysodeixis chalcites</i> NPV		ChchNPV	NC_007151
	63	<i>Chrysodeixis chalcites</i> NPV	genotype ChchSNPV-TF1-C	ChchNPV-TF1C	JX560539
	64	<i>Chrysodeixis chalcites</i> NPV	genotype ChchSNPV-TF1-H	ChchNPV-TF1H	JX560542
	65	<i>Chrysodeixis chalcites</i> NPV	genotype ChchSNPV-TF1-B	ChchSNPV-TF1B	JX560540
	66	<i>Chrysodeixis chalcites</i> NPV	genotype ChchSNPV-TF1-G	ChchSNPV-TF1G	JX560541
	67	<i>Chrysodeixis chalcites</i> NPV	genotype ChchSNPV-TF1-A	ChchSNPV-TF1A	JX535500
	68	<i>Clanis bilineata</i> NPV	Isolate DZ1	ClbiNPV	NC_008293
	69	<i>Ectropis obliqua</i> NPV	Strain A1	EcobNPV	NC_008586
	70	<i>Ectropis obliqua</i> NPV	Strain Unioasis 1	EcobNPV-U1	KC960018
	71	<i>Euproctis pseudoconspersa</i> NPV		EupsNPV	NC_012639
	72	<i>Helicoverpa armigera</i> MNPV		HaMNPV	NC_011615
	73	<i>Helicoverpa armigera</i> NPV	Isolate Australia	HaNPV-Aus	JN584482
	74	<i>Helicoverpa armigera</i> NPV	Strain C1	HaNPV-C1	NC_003094
	75	<i>Helicoverpa armigera</i> NPV	Strain G4	HaNPV-G4	NC_002654
	76	<i>Helicoverpa armigera</i> SNPV	Strain NNg1	HaSNPV	NC_011354
	77	<i>Helicoverpa armigera</i> SNPV	Isolate H25EA1	HaSNPV-H25EA1	KJ922128

78	<i>Helicoverpa armigera</i> SNPV	Strain AC53	HaSNPV-AC53	NC_024688
79	<i>Helicoverpa armigera</i> NPV	Strain SP1A	HaNPV-SP1A	KJ701032
80	<i>Helicoverpa armigera</i> NPV	Strain SP1B	HaNPV-SP1B	KJ701033
81	<i>Helicoverpa armigera</i> NPV	Strain L1	HaNPV-L1	KT013224
82	<i>Helicoverpa armigera</i> NPV	Strain LB1	HaNPV-LB1	KJ701029
83	<i>Helicoverpa armigera</i> NPV	Strain LB3	HaNPV-LB3	KJ701030
84	<i>Helicoverpa armigera</i> NPV	Strain LB6	HaNPV-LB6	KJ701031
85	<i>Helicoverpa armigera</i> NPV	Strain AC53T4.1	HaSNPV-T4-1	KU738902
86	<i>Helicoverpa armigera</i> NPV	Strain AC53T4.2	HaSNPV-T4-2	KU738903
87	<i>Helicoverpa armigera</i> NPV	Strain AC53C1	HaSNPV-C1	KU738896
88	<i>Helicoverpa armigera</i> NPV	Strain AC53C3	HaSNPV-C3	KU738897
89	<i>Helicoverpa armigera</i> NPV	Strain AC53C5	HaSNPV-C5	KU738898
90	<i>Helicoverpa armigera</i> NPV	Strain AC53C6	HaSNPV-C6	KU738899
91	<i>Helicoverpa armigera</i> NPV	Strain AC53C9	HaSNPV-C9	KU738900
92	<i>Helicoverpa zea</i> NPV		HezeNPV	NC_003349
93	<i>Helicoverpa zea</i> SNPV	Strain HS-18	HezeSNPV-HS18	KJ004000
94	<i>Helicoverpa zea</i> SNPV	Isolate Br/South	HezeSNPV-Br/South	KM596835
95	<i>Hemileuca</i> sp NPV		HespNPV	NC_021923
96	<i>Lambdina fiscellaria</i> NPV	Isolate GR15	LafiNPV-GR15	NC_026922
97	<i>Leucania separata</i> NPV	Strain AH1	LeseNPV	NC_008348
98	<i>Lymantria dispar</i> MNPV		LdMNPV	NC_001973
99	<i>Lymantria dispar</i> MNPV	Isolate LdMNPV-27	LdMNPV-27	KP027546
100	<i>Lymantria dispar</i> MNPV	Strain 3029	LdMNPV-3029	KM386655
101	<i>Lymantria dispar</i> MNPV	Isolate 2161	LdMNPV-2161	KF695050
102	<i>Lymantria dispar</i> MNPV	Isolate BNP	LdMNPV-BNP	KU377538
103	<i>Lymantria dispar</i> MNPV	Isolate RR01	LdMNPV-RR01	KX618634
104	<i>Lymantria dispar</i> MNPV	Isolate Aba624	LdMNPV-Aba624	KT626572
105	<i>Lymantria dispar</i> MNPV	Strain 3041	LdMNPV-3041	KT626571
106	<i>Lymantria dispar</i> MNPV	Strain 3054	LdMNPV-3054	KT626570
107	<i>Lymantria dispar</i> MNPV	Isolate 45/0	LdMNPV-45/0	KU862282
108	<i>Lymantria xyli</i> MNPV	Isolate LyxyMNPV-5	LyxyMNPV	NC_013953
109	<i>Mamestra brassicae</i> MNPV	Isolate Chb1	MabrMNPV-Chb1	JX138237

110	<i>Mamestra brassicae</i> MNPV	Isolate CTa	MabrMNPV-CTa	KJ871680
111	<i>Mamestra brassicae</i> MNPV	Isolate K1	MabrMNPV-K1	NC_023681
112	<i>Mamestra configurata</i> NPV	Strain A90-2	McNPV-90-2	NC_003529
113	<i>Mamestra configurata</i> NPV	Strain A90-4	McNPV-90-4	AF539999
114	<i>Mamestra configurata</i> NPV	Strain B	McNPV-B	NC_004117
115	<i>Orgyia leucostigma</i> NPV	Isolate CFS77	OrleNPV	NC_010276
116	<i>Peridroma sp</i> NPV	Isolate GR-167	PespNPV	NC_024625
117	<i>Perigonia lusca</i> SNPV		PeluSNPV	NC_027923
118	<i>Pseudoplusia includens</i> SNPV	IE	PsinSNPV-IE	NC_026268
119	<i>Pseudoplusia includens</i> SNPV	IA	PsinSNPV-IA	KU669289
120	<i>Pseudoplusia includens</i> SNPV	IB	PsinSNPV-IB	KU669290
121	<i>Pseudoplusia includens</i> SNPV	IC	PsinSNPV-IC	KU669291
122	<i>Pseudoplusia includens</i> SNPV	ID	PsinSNPV-ID	KU669292
123	<i>Pseudoplusia includens</i> SNPV	IF	PsinSNPV-IF	KU669293
124	<i>Pseudoplusia includens</i> SNPV	IG	PsinSNPV-IG	KU669294
125	<i>Spodoptera exigua</i> MNPV		SeMNPV	NC_002169
126	<i>Spodoptera exigua</i> MNPV	Isolate HT-SeG25	SeMNPV-HT-SeG25	HG425347
127	<i>Spodoptera exigua</i> MNPV	Isolate HT-SeG24	SeMNPV-HT-SeG24	HG425346
128	<i>Spodoptera exigua</i> MNPV	Isolate VT-SeAl1	SeMNPV-VT-SeAl1	HG425343
129	<i>Spodoptera exigua</i> MNPV	Isolate HT-SeSP2A	SeMNPV-HT-SeSP2A	HG425349
130	<i>Spodoptera exigua</i> MNPV	Isolate HT-SeG26	SeMNPV-HT-SeG26	HG425348
131	<i>Spodoptera exigua</i> MNPV	Isolate VT-SeAl2	SeMNPV-VT-SeAl2	HG425344
132	<i>Spodoptera exigua</i> MNPV	Isolate VT-SeOx4	SeMNPV-VT-SeOx4	HG425345
133	<i>Spodoptera frugiperda</i> MNPV	Isolate 3AP2	SfMNPV-3AP2	NC_009011
134	<i>Spodoptera frugiperda</i> MNPV	Isolate Nicaraguan	SfMNPV-Nic	HM595733
135	<i>Spodoptera frugiperda</i> MNPV	Isolate Nicaraguan DefG	SfMNPV-NicG	JF899325
136	<i>Spodoptera frugiperda</i> MNPV	Strain 19	SfMNPV-19	EU258200
137	<i>Spodoptera frugiperda</i> MNPV	Isolate Colombian	SfMNPV-Col	KF891883
138	<i>Spodoptera littoralis</i> NPV	Isolate AN1956	SpliNPV-AN1956	JX454574
139	<i>Spodoptera litura</i> II MNPV		SpltMNPV-II	NC_011616
140	<i>Spodoptera litura</i> MNPV	Strain G2	SpltMNPV-G2	NC_003102
141	<i>Suca jujuba</i> NPV	Isolate 473	SujuNPV-473	KJ676450
142	<i>Trichoplusia ni</i> SNPV		TnSNPV	NC_007383

Betabaculovirus	143	<i>Urbanus proteus</i> NPV	Isolate Southern Brazil	UrprNPV	NC_029997
	144	<i>Adoxophyes orana</i> GV		AdorGV	NC_005038
	145	<i>Adoxophyes orana</i> GV	Strain Miyazaki	AdorGV-Miy	KM226332
	146	<i>Agrotis segetum</i> GV		AgseGV	NC_005839
	147	<i>Agrotis segetum</i> GV	Strain L1	AgseGV-L1	KC994902
	148	<i>Agrotis segetum</i> GV	Strain DA	AgseGV-DA	KR584663
	149	<i>Choristoneura occidentalis</i> GV		ChocGV	NC_008168
	150	<i>Clostera anachoreta</i> GV	Isolate HBHN	ClanGV	NC_015398
	151	<i>Clostera anastomosis</i> GV	Strain Henan	CalGV	NC_022646
	152	<i>Cnapahlocrocis medinalis</i> GV	Strain Enping	CnmeGV-E	NC_029304
	153	<i>Cnapahlocrocis medinalis</i> GV		CnmeGV	KP658210
	154	<i>Cryptophlebia leucotreta</i> GV		CrleGV	NC_005068
	155	<i>Cydia pomonella</i> GV		CpGV	NC_002816
	156	<i>Cydia pomonella</i> GV	Isolate CpGV-S	CpGV-S	KM217573
	157	<i>Cydia pomonella</i> GV	Isolate CpGV-I12	CpGV-I12	KM217576
	158	<i>Cydia pomonella</i> GV	Isolate CpGV-M	CpGV-M	KM217575
	159	<i>Cydia pomonella</i> GV	Isolate CpGV-I07	CpGV-I07	KM217574
	160	<i>Diatraea saccharalis</i> GV	Isolate DisaGV-Parana-2009	DisaGV-P09	NC_028491
	161	<i>Epinotia aporema</i> GV		EpapGV	NC_018875
	162	<i>Helicoverpa armigera</i> GV		HearGV	NC_010240
	163	<i>Mocis</i> sp GV	Isolate Southern Brazil	MospGV	NC_029996
	164	<i>Mythimna unipuncta</i> GV	Isolate MyunGV#8	MyunGV	NC_033780
	165	<i>Phthorimaea operculella</i> GV		PhopGV	NC_004062
	166	<i>Phthorimaea operculella</i> GV	Isolate SA	PhopGV-SA	KU666536
	167	<i>Pseudaletia unipuncta</i> GV	Strain Hawaiiin	PsunGV	NC_013772
	168	<i>Pieris rapae</i> GV	Strain E3	PiraGV-E3	GU111736
	169	<i>Pieris rapae</i> GV	South Korea	PiraGV-SK	JX968491
	170	<i>Plodia interpunctella</i> GV	Isolate Cambridge	PlinGV	NC_032255
	171	<i>Plutella xylostella</i> GV		PxGV	NC_002593
	172	<i>Plutella xylostella</i> GV	Isolate SA	PlxyGV-SA	KU666537
	173	<i>Plutella xylostella</i> GV	Isolate C	PlxyGV-C	KU529791
	174	<i>Plutella xylostella</i> GV	Isolate K	PlxyGV-K	KU529792
	175	<i>Plutella xylostella</i> GV	Isolate M	PlxyGV-M	KU529793
	176	<i>Plutella xylostella</i> GV	Isolate T	PlxyGV-T	KU529794
	177	<i>Spodoptera frugiperda</i> GV	Isolate VG008	SpfrGV	NC_026511
	178	<i>Spodoptera litura</i> GV	Strain K1	SpltGV	NC_009503
	179	<i>Trichplusia ni</i> GV	Isolate LBIV-12	TrniGV-LBIV12	KU752557
	180	<i>Xestia c nigrum</i> GV		XecnGV	NC_002331