

Table S1. Clade 2.3.4.4b H5N1 highly pathogenic avian influenza viruses isolated in this study

Host		Virus name	Collection date	Region	Genetic group	Sample type	latitude	longitude	Cleavage site	GISAID PB2 accession	GISAID PB1 accession	GISAID PA accession	GISAID HA accession	GISAID NP accession	GISAID NA accession	GISAID MP accession	GISAID NS accession
Wild bird	Mandarin Duck	A/mandarin duck/Korea/WA585/2021	2021-10-26	CN	I	Swab	36°44'56"N	127°7'37"E	PLRERRRKR*GLF	EPI2205104	EPI2205103	EPI2205102	EPI2205101	EPI2205100	EPI2205099	EPI2205098	EPI2205097
	Mandarin Duck	A/mandarin duck/Korea/H519/2021	2021-11-05	JB	I	Feces	35°37'26"N	126°51'40"E	PLRERRRKR*GLF	EPI2540373	EPI2540374	EPI2540372	EPI2540376	EPI2540369	EPI2540375	EPI2540371	EPI2540370
	Mandarin Duck	A/mandarin duck/Korea/WA622/2021	2021-11-09	JB	I	Swab	35°40'38"N	126°53'30"E	PLRERRRKR*GLF	EPI2540381	EPI2540382	EPI2540380	EPI2540384	EPI2540377	EPI2540383	EPI2540379	EPI2540378
	Mandarin Duck	A/mandarin duck/Korea/H552/2021	2021-11-15	GG	I	Feces	37°13'49"N	127°26'28"E	PLRERRRKR*GLF	EPI2540389	EPI2540390	EPI2540388	EPI2540392	EPI2540385	EPI2540391	EPI2540387	EPI2540386
	Mallard	A/mallard/Korea/WA44/2022	2022-01-13	CN	II	Swab	36°48'32"N	126°58'25"E	PLRERRRKR*GLF	EPI2540397	EPI2540398	EPI2540396	EPI2540400	EPI2540393	EPI2540399	EPI2540395	EPI2540394
	Wild duck	A/wild duck/Korea/H152/2022	2022-02-08	GG	II	Feces	37°12'53"N	127°1'10"E	PLRERRRKR*GLF	EPI2540405	EPI2540406	EPI2540404	EPI2540408	EPI2540401	EPI2540407	EPI2540403	EPI2540402
Poultry	Quail	A/quail/Korea/H526/2021	2021-11-09	CB	I	Organ	36°59'28"N	127°32'41"E	PLRERRRKR*GLF	EPI1938269	EPI1938270	EPI1938271	EPI1938272	EPI1938273	EPI1938274	EPI1938275	EPI1938276
	Duck	A/duck/Korea/H535-2/2021	2021-11-10	CB	I	Organ	36°59'7"N	127°32'8"E	PLRERRRKR*GLF	EPI2540413	EPI2540414	EPI2540412	EPI2540416	EPI2540409	EPI2540415	EPI2540411	EPI2540410
	Duck	A/duck/Korea/H541-3/2021	2021-11-11	JN	I	Organ	34°54'39"N	126°43'4"E	PLRERRRKR*GLF	EPI2540421	EPI2540422	EPI2540420	EPI2540424	EPI2540417	EPI2540423	EPI2540419	EPI2540418
	Duck	A/duck/Korea/H543/2021	2021-11-14	CB	I	Organ	37°0'7"N	127°34'15"E	PLRERRRKR*GLF	EPI2540781	EPI2540782	EPI2540780	EPI2540784	EPI2540777	EPI2540783	EPI2540779	EPI2540778
	Duck	A/duck/Korea/H550/2021	2021-11-16	JN	I	Organ	34°29'58"N	126°41'38"E	PLRERRRKR*GLF	EPI2540429	EPI2540430	EPI2540428	EPI2540432	EPI2540425	EPI2540431	EPI2540427	EPI2540426
	Duck	A/duck/Korea/H554/2021	2021-11-17	JN	I	Organ	34°55'23"N	126°43'1"E	PLRERRRKR*GLF	EPI2540437	EPI2540438	EPI2540436	EPI2540440	EPI2540433	EPI2540439	EPI2540435	EPI2540434
	Chicken	A/chicken/Korea/H559/2021	2021-11-21	CB	I	Organ	36°59'29"N	127°33'46"E	PLRERRRKR*GLF	EPI2540445	EPI2540446	EPI2540444	EPI2540448	EPI2540441	EPI2540447	EPI2540443	EPI2540442
	Duck	A/duck/Korea/H560/2021	2021-11-22	JN	I	Organ	35°14'40"N	127°0'47"E	PLRERRRKR*GLF	EPI2540453	EPI2540454	EPI2540452	EPI2540456	EPI2540449	EPI2540455	EPI2540451	EPI2540450
	Chicken	A/chicken/Korea/H589/2021	2021-12-04	CN	I	Organ	36°45'5"N	127°6'53"E	PLRERRRKR*GLF	EPI2540461	EPI2540462	EPI2540460	EPI2540464	EPI2540457	EPI2540463	EPI2540459	EPI2540458
	Chicken	A/chicken/Korea/H590/2021	2021-12-05	JN	I	Organ	34°44'35"N	126°27'42"E	PLRERRRKR*GLF	EPI2540469	EPI2540470	EPI2540468	EPI2540472	EPI2540465	EPI2540471	EPI2540467	EPI2540466
	Chicken	A/chicken/Korea/H605/2021	2021-12-11	CN	I	Organ	36°43'41"N	127°8'49"E	PLRERRRKR*GLF	EPI2540477	EPI2540478	EPI2540476	EPI2540480	EPI2540473	EPI2540479	EPI2540475	EPI2540474
	Duck	A/duck/Korea/H608/2021	2021-12-13	JN	III	Organ	34°52'6"N	126°32'4"E	PLRERRRKR*GLF	EPI2540485	EPI2540486	EPI2540484	EPI2540488	EPI2540481	EPI2540487	EPI2540483	EPI2540482
	Duck	A/duck/Korea/H609/2021	2021-12-13	JN	III	Organ	34°52'9"N	126°32'6"E	PLRERRRKR*GLF	EPI2540493	EPI2540494	EPI2540492	EPI2540496	EPI2540489	EPI2540495	EPI2540491	EPI2540490
	Chicken	A/chicken/Korea/H617/2021	2021-12-14	CN	I	Organ	36°51'28"N	126°59'51"E	PLRERRRKR*GLF	EPI2540501	EPI2540502	EPI2540500	EPI2540504	EPI2540497	EPI2540503	EPI2540499	EPI2540498
	Duck	A/duck/Korea/H621/2021	2021-12-15	JN	I	Organ	34°54'5"N	126°41'9"E	PLRERRRKR*GLF	EPI2540509	EPI2540510	EPI2540508	EPI2540512	EPI2540505	EPI2540511	EPI2540507	EPI2540506
	Chicken	A/chicken/Korea/H623/2021	2021-12-16	SJ	I	Organ	36°33'29"N	127°18'33"E	PLRERRRKR*GLF	EPI2540517	EPI2540518	EPI2540516	EPI2540520	EPI2540513	EPI2540519	EPI2540515	EPI2540514
	Quail	A/quail/Korea/H624/2021	2021-12-17	GG	I	Organ	37°48'30"N	126°53'45"E	PLRERRRKR*GLF	EPI2540525	EPI2540526	EPI2540524	EPI2540528	EPI2540521	EPI2540527	EPI2540523	EPI2540522
	Chicken	A/chicken/Korea/H625/2021	2021-12-20	JN	III	Organ	34°50'8"N	126°34'34"E	PLRERRRKR*GLF	EPI2540533	EPI2540534	EPI2540532	EPI2540536	EPI2540529	EPI2540535	EPI2540531	EPI2540530
	Chicken	A/chicken/Korea/H638/2021	2021-12-23	SJ	I	Organ	36°30'44"N	127°22'35"E	PLRERRRKR*GLF	EPI2540541	EPI2540542	EPI2540540	EPI2540544	EPI2540537	EPI2540543	EPI2540539	EPI2540538
	Duck	A/duck/Korea/H640/2021	2021-12-27	JB	I	Organ	35°35'24"N	126°35'22"E	PLRERRRKR*GLF	EPI2540549	EPI2540550	EPI2540548	EPI2540552	EPI2540545	EPI2540551	EPI2540547	EPI2540546
	Duck	A/duck/Korea/H649/2021	2021-12-29	JN	II	Organ	34°49'53"N	126°29'59"E	PLRERRRKR*GLF	EPI2540557	EPI2540558	EPI2540556	EPI2540560	EPI2540553	EPI2540559	EPI2540555	EPI2540554
	Duck	A/duck/Korea/H13/2022	2022-01-06	JB	II	Organ	35°40'26"N	126°54'2"E	PLRERRRKR*GLF	EPI2540565	EPI2540566	EPI2540564	EPI2540568	EPI2540561	EPI2540567	EPI2540563	EPI2540562

Duck	A/duck/Korea/H38/2022	2022-01-14	JN	I	Organ	34°47'33"N	126°36'11"E	PLRERRRKR*GLF	EPI2540573	EPI2540574	EPI2540572	EPI2540576	EPI2540569	EPI2540575	EPI2540571	EPI2540570
Duck	A/duck/Korea/H56/2022	2022-01-21	CB	II	Organ	36°57'8"N	127°26'33"E	PLRERRRKR*GLF	EPI2540581	EPI2540582	EPI2540580	EPI2540584	EPI2540577	EPI2540583	EPI2540579	EPI2540578
Chicken	A/chicken/Korea/H57/2022	2022-01-21	GG	II	Organ	37°5'11"N	126°52'51"E	PLRERRRKR*GLF	EPI2540589	EPI2540590	EPI2540588	EPI2540592	EPI2540585	EPI2540591	EPI2540587	EPI2540586
Chicken	A/chicken/Korea/H58/2022	2022-01-21	GG	II	Organ	37°10'20"N	126°51'16"E	PLRERRRKR*GLF	EPI2540597	EPI2540598	EPI2540596	EPI2540600	EPI2540593	EPI2540599	EPI2540595	EPI2540594
Chicken	A/chicken/Korea/H63/2022	2022-01-24	CN	II	Organ	36°43'47"N	127°6'59"E	PLRERRRKR*GLF	EPI2540605	EPI2540606	EPI2540604	EPI2540608	EPI2540601	EPI2540607	EPI2540603	EPI2540602
Duck	A/duck/Korea/H79/2022	2022-01-25	JB	III	Organ	35°41'47"N	126°43'0"E	PLRERRRKR*GLF	EPI2540613	EPI2540614	EPI2540612	EPI2540616	EPI2540609	EPI2540615	EPI2540611	EPI2540610
Duck	A/duck/Korea/H87/2022	2022-01-29	JB	II	Organ	35°45'25"N	126°59'21"E	PLRERRRKR*GLF	EPI2540621	EPI2540622	EPI2540620	EPI2540624	EPI2540617	EPI2540623	EPI2540619	EPI2540618
Chicken	A/chicken/Korea/H88/2022	2022-01-30	CN	II	Organ	36°45'32"N	126°50'11"E	PLRERRRKR*GLF	EPI2540629	EPI2540630	EPI2540628	EPI2540632	EPI2540625	EPI2540631	EPI2540627	EPI2540626
Duck	A/duck/Korea/H90/2022	2022-01-31	CB	II	Organ	36°54'44"N	127°27'4"E	PLRERRRKR*GLF	EPI2540637	EPI2540638	EPI2540636	EPI2540640	EPI2540633	EPI2540639	EPI2540635	EPI2540634
Chicken	A/chicken/Korea/H91/2022	2022-02-02	CN	II	Organ	36°57'46"N	127°6'38"E	PLRERRRKR*GLF	EPI2540645	EPI2540646	EPI2540644	EPI2540648	EPI2540641	EPI2540647	EPI2540643	EPI2540642
Korean native chicken	A/Korean native chicken/Korea/H97/2022	2022-02-03	CN	II	Organ	36°43'52"N	127°8'14"E	PLREKRRKR*GLF	EPI2540653	EPI2540654	EPI2540652	EPI2540656	EPI2540649	EPI2540655	EPI2540651	EPI2540650
Chicken	A/chicken/Korea/H124/2022	2022-02-04	JB	III	Organ	35°41'24"N	126°43'8"E	PLRGKRRKR*GLF	EPI2540661	EPI2540662	EPI2540660	EPI2540664	EPI2540657	EPI2540663	EPI2540659	EPI2540658
Duck	A/duck/Korea/H125/2022	2022-02-05	JB	IV	Organ	35°39'30"N	126°45'58"E	PLRERRRKR*GLF	EPI2205112	EPI2205111	EPI2205110	EPI2205109	EPI2205108	EPI2205107	EPI2205106	EPI2205105
Korean native chicken	A/Korean native chicken/Korea/H127/2022	2022-02-06	CN	IV	Organ	36°27'28"N	126°34'1"E	PLRERRRKR*GLF	EPI2540669	EPI2540670	EPI2540668	EPI2540672	EPI2540665	EPI2540671	EPI2540667	EPI2540666
Duck	A/duck/Korea/H128/2022	2022-02-07	CB	II	Organ	36°53'52"N	127°28'6"E	PLREKRRKR*GLF	EPI2540677	EPI2540678	EPI2540676	EPI2540680	EPI2540673	EPI2540679	EPI2540675	EPI2540674
Chicken	A/chicken/Korea/H129/2022	2022-02-07	GG	II	Organ	37°6'26"N	127°0'38"E	PLRERRRKR*GLF	EPI2540685	EPI2540686	EPI2540684	EPI2540688	EPI2540681	EPI2540687	EPI2540683	EPI2540682
Chicken	A/chicken/Korea/H130/2022	2022-02-07	JB	IV	Organ	35°34'5"N	126°45'55"E	PLRERRRKR*GLF	EPI2540693	EPI2540694	EPI2540692	EPI2540696	EPI2540689	EPI2540695	EPI2540691	EPI2540690
Duck	A/duck/Korea/H138/2022	2022-02-08	CB	II	Organ	36°46'40"N	127°24'45"E	PLRERRRKR*GLF	EPI2540701	EPI2540702	EPI2540700	EPI2540704	EPI2540697	EPI2540703	EPI2540699	EPI2540698
Quail	A/quail/Korea/H139/2022	2022-02-08	CN	II	Organ	36°45'52"N	126°45'4"E	PLRERRRKR*GLF	EPI2540709	EPI2540710	EPI2540708	EPI2540712	EPI2540705	EPI2540711	EPI2540707	EPI2540706
Chicken	A/chicken/Korea/H141/2022	2022-02-09	CN	II	Organ	36°47'19"N	126°55'54"E	PLRERRRKR*GLF	EPI2540717	EPI2540718	EPI2540716	EPI2540720	EPI2540713	EPI2540719	EPI2540715	EPI2540714
Duck	A/duck/Korea/H153/2022	2022-02-12	CB	II	Organ	36°52'29"N	127°54'18"E	PLRERRRKR*GLF	EPI2540725	EPI2540726	EPI2540724	EPI2540728	EPI2540721	EPI2540727	EPI2540723	EPI2540722
Chicken	A/chicken/Korea/H154-1/2022	2022-02-13	CN	II	Organ	36°46'28"N	126°45'6"E	PLREKRRKR*GLF	EPI2540733	EPI2540734	EPI2540732	EPI2540736	EPI2540729	EPI2540735	EPI2540731	EPI2540730
Chicken	A/chicken/Korea/H155/2022	2022-02-12	CB	II	Organ	36°53'31"N	127°28'6"E	PLRERRRKR*GLF	EPI2540741	EPI2540742	EPI2540740	EPI2540744	EPI2540737	EPI2540743	EPI2540739	EPI2540738
Duck	A/duck/Korea/H196/2022	2022-02-18	CN	IV	Organ	36°5'53"N	127°5'55"E	PLRGKRRKR*GLF	EPI2540749	EPI2540750	EPI2540748	EPI2540752	EPI2540745	EPI2540751	EPI2540747	EPI2540746
Duck	A/duck/Korea/H200/2022	2022-02-21	GN	II	Organ	35°3'26"N	127°55'1"E	PLRERRRKR*GLF	EPI2540757	EPI2540758	EPI2540756	EPI2540760	EPI2540753	EPI2540759	EPI2540755	EPI2540754
Duck	A/duck/Korea/H232/2022	2022-03-02	JN	IV	Organ	34°44'4"N	127°21'3"E	PLRERRRKR*GLF	EPI2540765	EPI2540766	EPI2540764	EPI2540768	EPI2540761	EPI2540767	EPI2540763	EPI2540762
Chicken	A/chicken/Korea/H384/2022	2022-04-07	GN	II	Organ	35°17'5"N	128°49'50"E	PLRERRRKR*GLF	EPI2540773	EPI2540774	EPI2540772	EPI2540776	EPI2540769	EPI2540775	EPI2540771	EPI2540770

JB, Jeonbuk; JN, Jeonnam; GG, Gyeonggi; CB, Chungbuk; CN, Chungnam; SJ, Sejong