Supplementary Table S1. Cytochrome c oxidase subunit 1 (CO1) haplotypes of *Rhinolophus* species analysed in this study

Supplementary Table S2. Geographic records used to infer the ecological niche of bat viruses related to SARS-CoV.

Supplementary Figure S1. Model performance in geographic space on training data.

Ecological niche of bat viruses related to SARS-CoV (SCoVrCs).

Supplementary Figure S2. Model performance in geographic space on training data.

Ecological niches of bat viruses closely related to SARS-CoV-2 (SCoV2rCs) predicted using 4 points (data set A).

Supplementary Figure S3. Model performance in geographic space on training data.

Ecological niches of bat viruses closely related to SARS-CoV-2 (SCoV2rCs) predicted using 21 points (data set B).

Species	GenBank accession numbers	Haplotypes	Country	Location	Code	Latitude	Longitude	References	EN datasets
R. acuminatus	MW712895, MW712896	Rac1	Cambodia	Krong Preah Vihear	C2	13.7641	104.8592	This study	20 points, 30 points
R. acuminatus	MW712894	Rac1	Cambodia	near Kok Lak, Rattanakiri	C4	14.0186	106.7484	This study	20 points, 30 points
R. acuminatus	MW712891-MW712893	Rac1	Cambodia	Virachey	C5	14.2032	107.0050	This study	20 points, 30 points
R. acuminatus	MW712897	Rac1	Cambodia	Mondolkiri	C6	12.1803	106.9819	This study	20 points, 30 points
R. acuminatus	MW712898- MW712900	Rac2	Cambodia	Mondolkiri	C6	12.1803	106.9819	This study	20 points, 30 points
R. acuminatus	HM541312, HM541313, HM541317,	Rac1	Laos	Dong Hua Sao	L10	14.8220	106.0600	[1]	20 points, 30 points
R acuminatus	HM541318 HM541319 HM541320 HM541321	Rac1	Laos	Dong Kanthung	L.1.1	14 1750	105 5750	[1]	20 points 30 points
it. acammana	HM541322, HM541323, HM541324,	ituo i	Luob	Doing Hunthing	211	11.1700	100.0700	[*]	20 points, 20 points
	HM541314								
R. acuminatus	HM541315	Rac6	Laos	Dong Hua Sao	L10	14.8220	106.0600	[1]	30 points
R. acuminatus	HM541310, HM541311	Rac3	Malaysia	Tabin	M5	5.0830	118.6670	[1]	-
R. acuminatus	SRR13380249, SRR13380251	Rac1	Thailand	Khao Ang Rue Nai	T4	13.2067	101.7119	[2]	4 points, 20 points, 30 points
R. acuminatus	SRR13380250	Rac2	Thailand	Khao Ang Rue Nai	T4	13.2067	101.7119	[2]	4 points, 20 points, 30 points
R. acuminatus	SRR13380247	Rac4	Thailand	Khao Ang Rue Nai	T4	13.2067	101.7119	[2]	4 points, 20 points, 30 points
R. acuminatus	SRR13380248	Rac5	Thailand	Khao Ang Rue Nai	T4	13.2067	101.7119	[2]	4 points, 20 points, 30 points
R. acuminatus	HM541316	Rac1	Vietnam	Yok Don NP	V13	12.8670	107.7000	[1]	20 points, 30 points
R. acuminatus	HM914924, HM914925	Rac1	Vietnam	Bu Gia Map	V14	12.1940	107.2060	[2]	
R. acuminatus	HM541325, HM914901, HM914902,	Rac1	Vietnam	Cat Tien	V17	11.4170	107.4330	[1]	20 points, 30 points
	HM914913, HM914914								
R. affinis	MW712901- MW712909	Ra1	Cambodia	Preah Vihear Temple	C1	14.3594	104.7859	This study	
R. affinis	MW712910- MW712912	Ra1	Cambodia	Virachey	C5	14.2032	107.0050	This study	
R. affinis	MW712913, MW712914	Ra2	Cambodia	Virachey	C5	14.2032	107.0050	This study	
R. affinis	MW712915- MW712921	Ra3	Cambodia	Virachey	C5	14.2032	107.0050	This study	30 points
R. affinis	MW712922	Ra4	Cambodia	Virachey	C5	14.2032	107.0050	This study	
R. affinis	HM541383, HM541387	Ra3	China	Guangxi, Jing Xin County	Ch4	23.1170	105.9670	[1]	30 points
				Provincial Nature Reserve					
R. affinis	HM541347, HM541348, HM541353	Ra3	China	Guangxi, Shiwandashan	Ch5	21.8460	107.8890	[1]	30 points
D (22)	GDD 11005707	D (C1 ·	National Reserve	01.1	22 1210	101 (004	[2]	4
R. affinis	SRR11085797	Ra5	China	Moijang	Chl	23.4319	101.6924	[3]	4 points, 20 points, 30 points
R. affinis	HM541342, HM541343-6, HM541377-	Ra6	China	Guangxi, Jing Xin County	Ch4	23.1170	105.9670	[1]	
	82, HIVI541384-0, HIVI541388-90,			Provincial Nature Reserve					
D affinis	HWI541392-4 HM541240 HM541250 2 HM541254	D _o 6	China	Guanavi Shiwandashan	Ch5	21.8460	107 8800	[1]	
R. ajjinis	0 HM541369 76	као	China	National Reserve	CIIS	21.6400	107.8890	[1]	
R affinis	HM541391	Ra7	China	Guangxi Jing Xin County	Ch4	23 1170	105 9670	[1]	
R. ujjinis		itu /	China	Provincial Nature Reserve	Chi	23.1170	105.9070	[1]	
R. affinis	JF444035	Ra8	China	Shuhuangshan Reserve	Ch6	26.4167	111.0330	unpublished	
R. affinis	KP192694	Ra16	Indonesia	Sumatra	I1	-4.5597	105.4068	[4]	
R. affinis	KP192693	Ra17	Indonesia	Sumatra	I1	-4.5597	105.4068	[4]	
R. affinis	HM541335	Ra1	Laos	Dong Hua Sao	L10	14.8220	106.0600	[1]	
R. affinis	HM541336, HM541341	Ra10	Laos	Xiangkhoang, Nam Et	L2	20.0730	103.4330	[1]	
				NBCA					
R. affinis	HM541339, HM541340	Ra3	Laos	LouangNamtha	L1	20.7360	101.1670	[1]	30 points

Table S1. Cytochrome c oxidase subunit 1 (CO1) haplotypes of Rhinolophus species analysed in this study.

Table S1 - 1 / 4

R. affinis	HM541334	Ra3	Laos	Dong Hua Sao	L10	14.8220	106.0600	[1]	30 points
R. affinis	HM541366, HM541367	Ra3	Laos	TakLeuk	L5	18.3830	103.0670	[1]	30 points
R. affinis	HM541333	Ra3	Laos	Attapeu	L9	14.9500	107.1330	[1]	30 points
R. affinis	HM541365	Ra9	Laos	TakLeuk	L5	18.3830	103.0670	[1]	
R. affinis	HM541337, HM541338	Ra11	Malaysia	Cameron Highlands	M1	4.4600	101.3800	[1]	
R. affinis	HM541330	Ra11	Malaysia	Kuala Lompat	M2	3.7170	102.1670	l î î	
R affinis	HM541331 HM541332	Rall	Malaysia	Pasoh Forest	M3	2,9670	102 3000	[1]	
R affinis	HM541411 HM541412 HM541413	Rall	Malaysia	Endau Rompin	M4	2 5330	103 4000	[1]	
10 000 0000	HM541407-10		114449514	Linuwu reoimpin		2.0000	10011000	[+]	
R. affinis	HM541414	Ra12	Malaysia	Endau Rompin	M4	2.5330	103.4000	[1]	
R. affinis	MK410386	Ra13	Mvanmar	Chin	B1	22.8065	93.6998	[5]	
R. affinis	HM541326	Ra14	Mvanmar	Nyaungshwe	B5	20.6630	96.9670	[1]	
R. affinis	KP192682	Ra15	Mvanmar	Kadan	B6	12.4739	98.4032	[4]	
R. affinis	KY034102, KY034135	Ra1	Thailand	Loei	T2	17.5050	100.9380	unpublished	
R. affinis	KP192677, KP192678	Ra11	Thailand	Khuan Kalong	T5	7.0129	100.0210	[4]	
R. affinis	KY034109	Ra11	Thailand	Songkla	T6	6.9940	100.1490	unpublished	
R. affinis	KP192673, KP192675, KP192676	Ra11	Thailand	Hala Bala	T7	5.7983	101.8250	[4]	
R. affinis	KY034138	Ra18	Thailand	Loei	T2	17.5050	100.9380	unpublished	
R. affinis	KP192689, KP192690, KP192691	Ra19	Thailand	Adang	T6	6.5146	99.3173	[4]	
R. affinis	KY034134	Ra20	Thailand	Songkla	T6	6.9940	100.1490	unpublished	
R. affinis	KP192687, KP192688	Ra21	Thailand	Chieng Mai	T1	19.5093	98.8326	[4]	
R. affinis	KP192679, KP192680, KP192681	Ra22	Thailand	KhuanKalong	T5	7.0129	100.0210	[4]	
R. affinis	KP192692, KY034116, KY034119	Ra22	Thailand	Adang	T6	6.5146	99.3173	[4]	
R. affinis	KP192674	Ra23	Thailand	Hala Bala	Τ7	5.7983	101.8250	[4]	
R. affinis	HM541360	Ral	Vietnam	Ngoc Linh, Ouang Nam	V11	15.2088	107.7395	[1]	
R. affinis	HM541363	Ral	Vietnam	Cat Tien	V17	11.4170	107.4330	[1]	
R. affinis	MW712923	Ral	Vietnam	Huong Hoa	V9	16.9370	106.5810	This study	
R. affinis	MW712924, MW712925, HM541399,	Ra24	Vietnam	Tram Ton, Sapa	V1	22.3278	103.7792	This study.	
	HO580330							[1].	
								unpublished	
R. affinis	MW712926	Ra25	Vietnam	Hanoi. Ba Vi National	V4	21.0830	105.3730	This study	
				park					
R. affinis	MW712927-MW712929	Ra26	Vietnam	Hanoi, Ba Vi National	V4	21.0830	105.3730	This study	
555				park					
R. affinis	MW712930, HM541402	Ra27	Vietnam	Ngoc Linh, Kon Tum	V11	15.2088	107.7395	This study.	
								[1]	
R. affinis	MW712931	Ra28	Vietnam	Ngoc Linh, Kon Tum	V11	15.2088	107.7395	This study	
R. affinis	MW712932	Ra29	Vietnam	Kon Tum, Chu Mom Ray	V12	14,4250	107.7860	This study	
R. affinis	MW712933	Ra3	Vietnam	Dakrong	V10	16.6000	106.8667	This study	30 points
R. affinis	KP192684	Ra3	Vietnam	Vinh Phuc, Tam Dao	V2	21.5075	105.6082	[6]	30 points
				National Park				[~]	- · · · · · · · · · · · · · · · · · · ·
R. affinis	MW712934- MW712936	Ra3	Vietnam	Hanoi, Ba Vi National	V4	21.0830	105.3730	This study	30 points
				park					- · · · · · · · · · · · · · · · · · · ·
R. affinis	MW712937	Ra3	Vietnam	Thanh Hoa, Ba Thuoc	V5	20.4600	105.2520	This study	30 points
R. affinis	MW712938	Ra3	Vietnam	Thanh Hoa. Pu Luong	V6	20.3050	105.0120	This study	30 points
				Nature Reserve					
R. affinis	MW712939-MW712942	Ra3	Vietnam	Vu Quang	V8	18.3200	105.4360	This study	30 points
55	·		•		•	•	•		

R. affinis HM541398, HQ580331 Ra30 Vietnam Sapa, Hoang Lien NP V1 22.3278 103.7792 [1], unpublished unpublished R. affinis HM541304 Ra31 Vietnam Lao Cai, Ta Phinh V1 22.3278 103.7792 [1], unpublished R. affinis KP192663 Ra32 Vietnam Vie	R. affinis	MW712943-MW712945	Ra3 Vietnam	Huong Hoa	V9	16.9370	106.5810	This study	30 points
R. affinis HM541364 Ra31 Vietnam Lao Cai, Ta Phinh VI 22.3278 103.7792 [1] R. affinis KV7129633 Ra32 Vietnam Lao Cai, Ta Phinh V2 21.5075 105.6082 [4] R. affinis MV712964, HM541395, HM541401 Ra32 Vietnam Ngoc Linh, Quang Nam V11 15.2088 107.7395 [1], R. affinis GU684791, GU684792, GU684792, GU684798, Ra34 Vietnam Xau Truong V11 15.2088 107.7395 [1], R. affinis HM541361 Ra35 Vietnam Xau Truong V11 11.4170 107.4330 [1] R. affinis HM541322 Ra37 Vietnam Cat Tien V17 11.4170 107.4330 [1] R. affinis HM541328 Ra38 Vietnam Vu Quang V8 18.300 105.3450 [1] R. affinis HW712947 Ra6 Vietnam Vu Quang V8 11.8320 105.3730 This study R. affinis	R. affinis	HM541398, HQ580331	Ra30 Vietnam	Sapa, Hoang Lien NP	V1	22.3278	103.7792	[1],	
R. affinis HM541364 Ra31 Vietnam Lao Cai, Ta Phinh V1 22.3278 103.7792 [1] R. affinis KP192683 Ra32 Vietnam								unpublished	
R. affinis KP1292683 Ra32 Vienam Vienam V2 21.5075 105.6082 [4] R. affinis MW712946, HM541395, HM541401 Ra33 Vienam Ngo Linh, Quag Nam V11 15.2088 107.7395 [1] R. affinis MW712946, HM541395, HM541401 Ra33 Vienam Bi Doup-Nui Ba V15 12.1790 108.6790 [1] R. affinis HM541360 Ra36 Vienam Cat Tien V17 11.4170 107.4330 [1] R. affinis HM541323 Ra37 Vienam Cat Tien V17 11.4170 107.4330 [1] R. affinis HM541323 Ra38 Vienam Cat Tien V17 11.4170 107.4330 [1] R. affinis KP192685, KP192686 Ra6 Vienam Vu Quang V8 18.3200 105.6082 [4] R. affinis MW712947 Ra6 Vienam Put To, Xuan Son V3 21.1386 104.48592 This study R. malogramus MW712959 Rm1 Cambodia Krong Preah Vihear C1 14.3544 104.4859	R. affinis	HM541364	Ra31 Vietnam	Lao Cai, Ta Phinh	V1	22.3278	103.7792	[1]	
R. affinis MW712946, HM541395, HM541401 Ra33 Vietnam National Park Vietnam Vietnam R. affinis GU684791, GU684792, GU684798, GU684798, GU684798, GU684792, GU68479, GU68	R. affinis	KP192683	Ra32 Vietnam	Vinh Phuc, Tam Dao	V2	21.5075	105.6082	[4]	
R. affinis MW712946, HM541395, HM541401 Ra33 Vietnam Ngoc Linh, Quang Nam V11 15.2088 107.7395 [1] R. affinis IIM541396 Ra34 Vietnam Bi Doup-Nui Ba V15 12.1790 108.6790 [1] uppublished R. affinis IIM541361 Ra35 Vietnam Xuan Truong V16 11.8670 108.5500 [1] R. affinis IIM541361 Ra35 Vietnam Cat Tien V17 11.4170 107.4330 [1] R. affinis IMM541322 Ra37 Vietnam Vu Quang V8 18.3200 105.4360 [1] R. affinis MM712948-MW712957 Ra6 Vietnam Vu Quang V2 21.5075 104.9399 This study R. affinis MW712948-MW712957 Ra6 Vietnam Phu Tho, Xan Son V3 21.1386 104.3899 This study R. malayanus MW712958 Rm1 Cambodia Kampot C4 21.8386 101.2776 20 points, 30 points R. malayanus MW712959 Rm2 Cambodia Kampot China </td <td></td> <td></td> <td></td> <td>National Park</td> <td></td> <td></td> <td></td> <td></td> <td></td>				National Park					
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R. affinis HM541396 Ra35 Vietnam Xuan Truong V16 11.8670 108.5500 [1] R. affinis HM541361 Ra36 Vietnam Cat Tien V17 11.4170 107.4330 [1] R. affinis HM541329 Ra37 Vietnam Cat Tien V17 11.4170 107.4330 [1] R. affinis HM541329 Ra38 Vietnam Vu Quang V8 18.3200 105.4360 [1] R. affinis HM541329 Ra39 Vietnam Vu Quang V8 18.3200 105.4360 [1] R. affinis MW712947 Ra6 Vietnam Phu Tho, Xuan Son V3 21.1386 104.9399 This study R. affinis MW712948-MW712957 Ra6 Vietnam Phu Tho, Xuan Son V3 21.1386 104.7859 This study R. malayanus MW712959 Rm1 Cambodia Freah Vihear Cell 1.35761 104.8522 This study R. malayanus MW712960 Rm4 China Mengla County Ch3 21.9189 101.21716 8		GU684801, HM541327						unpublished	
R. affinis HM541361 Ra36 Vietnam Cat Tien V17 11.4170 107.4330 [1] R. affinis HM541362 Ra37 Vietnam Cat Tien V17 11.4170 107.4330 [1] R. affinis HM541328 Ra38 Vietnam Vu Quang V8 18.3200 105.4360 [1] R. affinis KP192685, KP192686 Ra6 Vietnam Vu Quang V8 18.3200 105.4360 [1] R. affinis MW712947 Ra6 Vietnam Vu Quang V4 21.075 105.6082 [4] R. affinis MW712947 Ra6 Vietnam Panoi, Ba Vi National V4 21.0830 105.3730 This study R. aflinis MW712958 Rm1 Cambodia Krong Preah Vihear C2 13.7641 104.7859 This study R. malayanus MW712960 Rm2 Cambodia Krong Preah Vihear C2 13.7641 104.8592 This study R. malayanus MK90706 Rm4 China Yunnan Ch2 21.8896 101.2716 [8]	R. affinis	HM541396	Ra35 Vietnam	Xuan Truong	V16	11.8670	108.5500	[1]	
R. affinis HM541362 Ra37 Vietnam Cat Tien V17 11.4170 107.4330 [1] R. affinis HM541328 Ra38 Vietnam Vu Quang V8 Its 3200 105.4360 [1] R. affinis HM541329 Ra6 Vietnam Vu Quang V8 Its 3200 105.4360 [1] R. affinis MW712947 Ra6 Vietnam Vu Quang V2 21.0375 105.6082 [4] R. affinis MW712948-MW712957 Ra6 Vietnam Phu Tho, Xuan Son V3 21.1386 104.9399 This study R. malayamus MW712958 Rm1 Cambodia Preab Vihear Temple C1 14.3594 104.7859 This study R. malayamus MW712950 Rm2 Cambodia Krong Preab Vihear C2 13.7641 104.8829 This study R. malayamus MK900704, MK900705 Rm4 China Yunnan Ch2 21.8866 101.2979 [7] 20 points, 30 points R. malayamus MK900706 Rm4 China Yunnan Ch2 21.8866	R. affinis	HM541361	Ra36 Vietnam	Cat Tien	V17	11.4170	107.4330	[1]	
R. affinis HM541328 Ra38 Vietnam Vu Quang V8 18.3200 105.4360 [1] R. affinis HM541329 Ra39 Vietnam Vu Quang V8 18.3200 105.4360 [1] R. affinis HM7129485, KP192686 Ra6 Vietnam Vu Quang V2 21.5075 105.6082 [4] R. affinis MW712947 Ra6 Vietnam Vu R. affinis NW712948-MW712957 Ra6 Vietnam Pautonal Park Pautonal Park Pautonal Park R. malayanus MW712948 Rm1 Cambodia Preath Vihear Temple C1 14.3594 104.7859 This study R. malayanus MW712950 Rm2 Cambodia Krong Preah Vihear C2 13.7641 104.8592 This study R. malayanus MK900704, MK900705 Rm4 China Yunnan C42 21.886 101.2716 [8] 4 points, 30 points R. malayanus MK900706 Rm5 China Yunnan Cb2 21.8896 101.2716 [8] 4 points, 20 points, 30 points R. malayanus HM541621<	R. affinis	HM541362	Ra37 Vietnam	Cat Tien	V17	11.4170	107.4330	[1]	
R. affinis HMS41329 Ra39 Vietnam Vu Quang V8 18.3200 105.4360 [1] R. affinis KP192685, KP192686 Ra6 Vietnam Vu Quang V2 21.5075 105.6082 [4] R. affinis MW712947 Ra6 Vietnam Phu Tho, Xuan Son V3 21.1386 104.9399 This study R. affinis MW712948-MW712957 Ra6 Vietnam Phu Tho, Xuan Son V3 21.1386 104.9399 This study R. malayanus MW712958 Rm1 Cambodia Krog Preah Vihear Temple C1 14.3594 104.7859 This study R. malayanus MW712960 Rm2 Cambodia Krog Preah Vihear C2 13.8764 104.7859 This study R. malayanus SRR12432009 Rm4 China Mengla County Ch2 21.8896 101.2979 [7] 20 points, 30 points R. malayanus MK900706 Rm3 China Yunnan Ch2 21.8896 101.2979 [7] 20 points, 30 points R. malayanus HM541610 Rm1 Laos	R. affinis	HM541328	Ra38 Vietnam	Vu Quang	V8	18.3200	105.4360	[1]	
R. affinis KP192685, KP192686 Ra6 Vietnam Vinh Phue, Tam Dao National Park V2 21.5075 105.6082 [4] R. affinis MW712947 Ra6 Vietnam Phu Tho, Xuan Son V3 21.1386 104.9399 This study R. affinis MW712948-MW712957 Ra6 Vietnam Phu Tho, Xuan Son V4 21.0830 105.3730 This study R. malayanus MW712958 Rm1 Cambodia Krong Preah Vihear Temple C1 14.3594 104.7859 This study R. malayanus MW712950 Rm2 Cambodia Krong Preah Vihear Temple C1 14.3594 104.7859 This study R. malayanus MK900704, MK900705 Rm4 China Yunnan Ch2 21.8866 101.2979 [7] 20 points, 30 points R. malayanus MK900706 Rm5 China Yunnan CA2 21.8866 101.2979 [7] 4 points, 20 points, 30 points R. malayanus HM541601 Rm1 Laos Dong Hua Sao L10	R. affinis	HM541329	Ra39 Vietnam	Vu Quang	V8	18.3200	105.4360	[1]	
R. affinisMW712947Ra6VietnamNational ParkPhu Tho, Xuan SonV321.1386 104.9399 This studyR. affinisMW712948-MW712957Ra6VietnamPhu Tho, Xuan SonV421.0830 105.3730 This studyR. malayanusMW712958Rm1CambodiaPreah VihearCl 14.3594 104.7859 This studyR. malayanusMW712950Rm2CambodiaPreah VihearCl 13.7641 104.8592 This studyR. malayanusMW712960Rm3CambodiaKrong Preah VihearCl 21.8896 101.2979 [7] 20 points, 30 pointsR. malayanusMK900704, MK900705Rm4ChinaYunnanCh2 21.8896 101.2979 [7] 4 points, 20 points, 30 pointsR. malayanusMK900706Rm5ChinaYunnanCh2 21.8896 101.2979 [7] 4 points, 20 points, 30 pointsR. malayanusHM541621Rm10LaosHin Nam NoL8 17.5670 105.8330 [1]R. malayanusHM541610Rm12LaosDong Hua SaoL10 14.8220 106.0600 [1]R. malayanusHM541613Rm4LaosLaosAttapeuL9 14.9500 107.130 [1]R. malayanusHM541614, HM541615, HM54166Rm6LaosLaosTakLeukL5 18.3830 103.0670 [1]R. malayanusHM541614, HM541615, Rm541616Rm6LaosTakLeukL5	R. affinis	KP192685, KP192686	Ra6 Vietnam	Vinh Phuc, Tam Dao	V2	21.5075	105.6082	[4]	
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R. malayanus MW712958 Rm1 Cambodia Preah Vihear Temple C1 14.3594 104.7859 This study R. malayanus MW712959 Rm2 Cambodia Krong Preah Vihear C2 13.7641 104.7859 This study R. malayanus MW712960 Rm3 Cambodia Kanpot C8 10.5597 104.2822 This study R. malayanus MK900704, MK900705 Rm4 China Yunnan Ch2 21.8896 101.2979 [7] 20 points, 30 points R. malayanus MK900706 Rm4 China Yunnan Ch2 21.8896 101.2979 [7] 20 points, 20 points, 30 points R. malayanus MK900706 Rm5 China Yunnan Ch2 21.8896 101.2979 [7] R. malayanus HM541621 Rm10 Laos Hin Nam No L8 17.5670 105.8330 [1] R. malayanus HM541610 Rm2 Laos Loas Attapeu L9 14.9500 107.1330 [1] R. malayanus HM541613 Rm4 Laos Loas				park					
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R. malayanus HM541621 Rm10 Laos Hin Nam No L8 17.5670 105.8330 [1] R. malayanus HM541622 Rm11 Laos Hin Nam No L8 17.5670 105.8330 [1] R. malayanus HM541610 Rm12 Laos Dong Hua Sao L10 14.8220 106.0600 [1] R. malayanus HM541606, HM541607, HM541608, HM541607, HM541608, HM541609 Rm2 Laos Attapeu L9 14.9500 107.1330 [1] 20 points, 30 points R. malayanus HM541613 Rm4 Laos LouagNamtha L1 20.7360 101.1670 [1] 20 points, 30 points R. malayanus HM541613, HM541615, HM541616 Rm4 Laos LouagNamtha L1 20.7360 101.1670 [1] 20 points, 30 points R. malayanus HM541614, HM541615, HM541616 Rm6 Laos TakLeuk L5 18.3830 103.0670 [1] 30 points R. malayanus HM541620 Rm8 Laos TakLeuk L5 18.3830 103.0670 [1] R R. malayanus <td>R. malayanus</td> <td>MK900706</td> <td>Rm5 China</td> <td>Yunnan</td> <td>Ch2</td> <td>21.8896</td> <td>101.2979</td> <td>[7]</td> <td></td>	R. malayanus	MK900706	Rm5 China	Yunnan	Ch2	21.8896	101.2979	[7]	
R. malayanus HM541622 Rm11 Laos Hin Nam No L8 17.5670 105.8330 [1] R. malayanus HM541610 Rm12 Laos Dong Hua Sao L10 14.8220 106.0600 [1] R. malayanus HM541606, HM541607, HM541608, Rm2 Laos Attapeu L9 14.9500 107.1330 [1] R. malayanus HM541613 Rm4 Laos LouangNamtha L1 20.7360 101.1670 [1] 20 points, 30 points R. malayanus HM541614, HM541615, HM541616 Rm4 Laos Nam Khan L3 19.6823 102.3377 This study 20 points, 30 points R. malayanus HM541614, HM541615, HM541616 Rm6 Laos TakLeuk L5 18.3830 103.0670 [1] 30 points R. malayanus HM541620 Rm8 Laos TakLeuk L5 18.3830 103.0670 [1] Rm9 Laos Ban Pomkhoun-Phonsong L7 17.6330 104.9500 [1] Rm1 Laos Hin Nam No L8 17.5670 105.8330 [1] Rm1 L1 <td>R. malayanus</td> <td>HM541621</td> <td>Rm10 Laos</td> <td>Hin Nam No</td> <td>L8</td> <td>17.5670</td> <td>105.8330</td> <td>[1]</td> <td></td>	R. malayanus	HM541621	Rm10 Laos	Hin Nam No	L8	17.5670	105.8330	[1]	
R. malayanus HM541610 Rm12 Laos Dong Hua Sao L10 14.8220 106.0600 [1] R. malayanus HM541606, HM541607, HM541608, HM541607, HM541608, HM541609 Rm2 Laos Attapeu L9 14.9500 107.1330 [1] R. malayanus HM541613 Rm4 Laos LouangNamtha L1 20.7360 101.1670 [1] 20 points, 30 points R. malayanus HM541614, HM541615, HM541616 Rm4 Laos Nam Khan L3 19.6823 102.3377 This study 20 points, 30 points R. malayanus HM541619 Rm6 Laos TakLeuk L5 18.3830 103.0670 [1] 30 points R. malayanus HM541619 Rm7 Laos TakLeuk L5 18.3830 103.0670 [1] 30 points R. malayanus HM541618 Rm8 Laos TakLeuk L5 18.3830 103.0670 [1] R. malayanus HM541618 Rm9 Laos Ban Pomkhoun-Phonsong L7 17.6330 104.9500 [1] R. malayanus HM541623 R	R. malayanus	HM541622	Rm11 Laos	Hin Nam No	L8	17.5670	105.8330	[1]	
R. malayanus HM541606, HM541607, HM541608, HM541609 Rm2 Laos Attapeu L9 14.9500 107.1330 [1] 20 points, 30 points R. malayanus HM541613 Rm4 Laos LouangNamtha L1 20.7360 101.1670 [1] 20 points, 30 points R. malayanus HM541613 Rm4 Laos Nam Khan L3 19.6823 102.3377 This study 20 points, 30 points R. malayanus HM541614, HM541615, HM541616 Rm6 Laos TakLeuk L5 18.3830 103.0670 [1] 30 points R. malayanus HM541620 Rm7 Laos TakLeuk L5 18.3830 103.0670 [1] 30 points R. malayanus HM541618 Rm9 Laos TakLeuk L5 18.3830 103.0670 [1] R	R. malayanus	HM541610	Rm12 Laos	Dong Hua Sao	L10	14.8220	106.0600	[1]	
HM541609 Rm4 Laos LouangNamtha L1 20.7360 101.1670 [1] 20 points, 30 points R. malayanus HM541613 Rm4 Laos Nam Khan L3 19.6823 102.3377 This study 20 points, 30 points R. malayanus HM541614, HM541615, HM541616 Rm4 Laos Nam Khan L3 19.6823 102.3377 This study 20 points, 30 points R. malayanus HM541614, HM541615, HM541616 Rm6 Laos TakLeuk L5 18.3830 103.0670 [1] 30 points R. malayanus HM541620 Rm8 Laos TakLeuk L5 18.3830 103.0670 [1] Points R. malayanus HM541620 Rm8 Laos TakLeuk L5 18.3830 103.0670 [1] Points Points R. malayanus HM541618 Rm9 Laos Ban Pomkhoun-Phonsong L7 17.6330 104.9500 [1] Points R. malayanus HM541624, HM541617, HM541623 Rm9 Laos Ban Pomkhoun-Phonsong L7 17.6330 104.9500 [1] </td <td>R. malayanus</td> <td>HM541606, HM541607, HM541608,</td> <td>Rm2 Laos</td> <td>Attapeu</td> <td>L9</td> <td>14.9500</td> <td>107.1330</td> <td>[1]</td> <td></td>	R. malayanus	HM541606, HM541607, HM541608,	Rm2 Laos	Attapeu	L9	14.9500	107.1330	[1]	
R. malayanus HM541613 Rm4 Laos LouangNamtha L1 20.7360 101.1670 [1] 20 points, 30 points R. malayanus MW712961 Rm4 Laos Nam Khan L3 19.6823 102.3377 This study 20 points, 30 points R. malayanus HM541614, HM541615, HM541616 Rm6 Laos TakLeuk L5 18.3830 103.0670 [1] 30 points R. malayanus HM541620 Rm7 Laos TakLeuk L5 18.3830 103.0670 [1] 30 points R. malayanus HM541620 Rm8 Laos TakLeuk L5 18.3830 103.0670 [1] R. malayanus HM541620 Rm8 Laos TakLeuk L5 18.3830 103.0670 [1] R. malayanus HM541623 Rm9 Laos Ban Pomkhoun-Phonsong L7 17.6370 104.9500 [1]	-	HM541609							
R. malayanus MW712961 Rm4 Laos Nam Khan L3 19.6823 102.3377 This study 20 points, 30 points R. malayanus HM541614, HM541615, HM541616 Rm6 Laos TakLeuk L5 18.3830 103.0670 [1] 30 points R. malayanus HM541619 Rm7 Laos TakLeuk L5 18.3830 103.0670 [1] 30 points R. malayanus HM541620 Rm8 Laos TakLeuk L5 18.3830 103.0670 [1] R R. malayanus HM541618 Rm9 Laos Ban Pomkhoun-Phonsong L7 17.6330 104.9500 [1] R. malayanus HM541624, HM541617, HM541623 Rm9 Laos Hin Nam No L8 17.5670 105.8330 [1] R. malayanus HM541624, HM541617, HM541623 Rm9 Laos Hin Nam No L8 17.5670 105.8330 [1]	R. malayanus	HM541613	Rm4 Laos	LouangNamtha	L1	20.7360	101.1670	[1]	20 points, 30 points
R. malayanus HM541614, HM541615, HM541616 Rm6 Laos TakLeuk L5 18.3830 103.0670 [1] 30 points R. malayanus HM541619 Rm7 Laos TakLeuk L5 18.3830 103.0670 [1] 30 points R. malayanus HM541620 Rm8 Laos TakLeuk L5 18.3830 103.0670 [1] R. malayanus HM541618 Rm9 Laos Ban Pomkhoun-Phonsong L7 17.6330 104.9500 [1] R. malayanus HM541624, HM541617, HM541623 Rm9 Laos Ban Pomkhoun-Phonsong L7 17.6370 104.9500 [1] R. malayanus HM541624, HM541617, HM541623 Rm9 Laos Hin Nam No L8 17.5670 105.8330 [1] R. malayanus KY000237 KY000237 Rm9 Laos Hin Nam No L8 17.5670 105.8330 [1]	R. malayanus	MW712961	Rm4 Laos	Nam Khan	L3	19.6823	102.3377	This study	20 points, 30 points
R. malayanus HM541619 Rm7 Laos TakLeuk L5 18.3830 103.0670 [1] R. malayanus HM541620 Rm8 Laos TakLeuk L5 18.3830 103.0670 [1] R. malayanus HM541618 Rm9 Laos Ban Pomkhoun-Phonsong L7 17.6330 104.9500 [1] R. malayanus HM541624, HM541617, HM541623 Rm9 Laos Ban Pomkhoun-Phonsong L7 17.6330 104.9500 [1] R. malayanus HM541624, HM541617, HM541623 Rm9 Laos Ban Pomkhoun-Phonsong L7 17.6670 105.8330 [1] R. malayanus HM541624, HM541623 Rm9 Laos Hin Nam No L8 17.5670 105.8330 [1]	R. malayanus	HM541614, HM541615, HM541616	Rm6 Laos	TakLeuk	L5	18.3830	103.0670	[1]	30 points
R. malayanus HM541620 Rm8 Laos TakLeuk L5 18.3830 103.0670 [1] R. malayanus HM541618 Rm9 Laos Ban Pomkhoun-Phonsong L7 17.6330 104.9500 [1] R. malayanus HM541624, HM541617, HM541623 Rm9 Laos Hin Nam No L8 17.5670 105.8330 [1] R. malayanus HM541627, KX000237 KX000237 KX000237 Rm9 Laos Hin Nam No L8 17.5670 105.8330 [1]	R. malayanus	HM541619	Rm7 Laos	TakLeuk	L5	18.3830	103.0670	[1]	*
R. malayanus HM541618 Rm9 Laos Ban Pomkhoun-Phonsong L7 17.6330 104.9500 [1] R. malayanus HM541624, HM541617, HM541623 Rm9 Laos Hin Nam No L8 17.5670 105.8330 [1] R. malayanus KX000227, KX000220 Rm9 Laos Hin Nam No L8 17.5670 105.8330 [1]	R. malayanus	HM541620	Rm8 Laos	TakLeuk	L5	18.3830	103.0670	[1]	
R. malayanus HM541624, HM541617, HM541623 Rm9 Laos Hin Nam No L8 17.5670 105.8330 [1] R. malayanus KX000227, KX000220 Rm9 Laos Hin Nam No L8 17.5670 105.8330 [1]	R. malayanus	HM541618	Rm9 Laos	Ban Pomkhoun-Phonsong	L7	17.6330	104.9500	[1]	
B malanamus KX000227 KX000220 Bm12 Muanmar NA	R. malayanus	HM541624, HM541617, HM541623	Rm9 Laos	Hin Nam No	L8	17.5670	105.8330	[1]	
$[\pi, matavanus]$ $[\pi, $	R. malavanus	KX099327, KX099330	Rm13 Myanma	r NA	B2	22.0476	95.9993	[9]	
<i>R. malayanus</i> HM541612 Rm13 Myanmar NA B3 22.1000 96.6200 [1]	R. malayanus	HM541612	Rm13 Myanma	r NA	B3	22.1000	96.6200	[1]	
<i>R. malayanus</i> KX099328, KX099329 Rm14 Myanmar NA B2 22.0476 95.9993 [9]	R. malayanus	KX099328, KX099329	Rm14 Myanma	r NA	B2	22.0476	95.9993	[9]	
<i>R. malayanus</i> KX099331 Rm15 Myanmar NA B2 22.0476 95.9993 [9]	R. malavanus	KX099331	Rm15 Myanma	r NA	B2	22.0476	95.9993	[9]	
<i>R. malayanus</i> KX099332 Rm16 Myanmar NA B2 22.0476 95.9993 9	R. malavanus	KX099332	Rm16 Myanma	r NA	B2	22.0476	95.9993	[9]	
<i>R. malayanus</i> HM541611 Rm17 Myanmar NA B4 22,4690 96,9930 [1]	R. malavanus	HM541611	Rm17 Myanma	IT NA	B4	22.4690	96,9930	l î 1	
R. malayanus MW712962 Rm19 Thailand Kanchanaburi T3 14.4500 98.8500 This study	R. malavanus	MW712962	Rm19 Thailand	Kanchanaburi	T3	14.4500	98.8500	This study	
<i>R. malayanus</i> MW712966-MW712971 Rm1 Vietnam Dakrong V10 16.6000 106.8667 This study	R. malavanus	MW712966-MW712971	Rm1 Vietnam	Dakrong	V10	16.6000	106.8667	This study	
R. malayanus MW712963 Rm1 Vietnam Ngoc Lac V7 20.0944 105.3797 This study	R. malayanus	MW712963	Rm1 Vietnam	Ngoc Lac	V7	20.0944	105.3797	This study	
R. malayanus MW712964 Rm1 Vietnam Huong Hoa V9 16.9370 106.5810 This study	R. malavanus	MW712964	Rm1 Vietnam	Huong Hoa	V9	16.9370	106.5810	This study	

R. malayanus	MW712965	Rm2	Vietnam	Dakrong	V10	16.6000	106.8667	This study	
R. malayanus	HM541604	Rm20	Vietnam	Phu Quoc	V18	10.2000	104.0000	[1]	
R. shameli	MW712972-MW712981	Rsh1	Cambodia	Preah Vihear Temple	C1	14.3594	104.7859	This study	20 points, 30 points
R. shameli	MW712982, MW712983	Rsh1	Cambodia	Krong Preah Vihear	C2	13.7641	104.8592	This study	20 points, 30 points
R. shameli	MW712984-MW713001	Rsh1	Cambodia	SroLav	C3	13.7914	105.6022	This study	4 points, 20 points, 30 points
R. shameli	MW713002-MW713030	Rsh1	Cambodia	Virachey	C5	14.2032	107.0050	This study	20 points, 30 points
R. shameli	MW713031	Rsh2	Cambodia	Preah Vihear Temple	C1	14.3594	104.7859	This study	30 points
R. shameli	MW713032	Rsh3	Cambodia	Krong Preah Vihear	C2	13.7641	104.8592	This study	30 points
R. shameli	HM541778	Rsh4	Cambodia	KaohKong	C7	11.6390	103.5740	[1]	-
R. shameli	MW713033, MW713034	Rsh5	Cambodia	Kampot	C8	10.5597	104.2822	This study	
R. shameli	HM541782, HM541783, HM541784,	Rsh1	Laos	Dong Hua Sao	L10	14.8220	106.0600	[1]	20 points, 30 points
	HM541793								
R. shameli	HM541785	Rsh1	Laos	Nam Kading	L4	18.8420	104.5830	[1]	20 points, 30 points
R. shameli	HM541786	Rsh1	Laos	Vientiane	L6	18.0830	102.6670	[1]	20 points, 30 points
R. shameli	HM541780, HM541781, HM541792,	Rsh1	Laos	near Hin Nam No	L8	17.5670	105.8330	[1],	20 points, 30 points
	JF444101							unpublished	
R. shameli	HM541788, HM541789, HM541790,	Rsh1	Laos	Attapeu	L9	14.9500	107.1330	[1]	20 points, 30 points
	HM541791			_					
R. shameli	HM541787, HM541794	Rsh6	Laos	Dong Kanthung	L11	14.1750	105.5750	[1]	30 points
R. shameli	HM541779	Rsh7	Laos	near Hin Nam No	L8	17.5670	105.8330	[1]	30 points
R. shameli	HM541777	Rsh5	Vietnam	PhuQuoc	V18	10.2000	104.0000	[1]	_

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Country	locality	Latitude	Longitude	References
China	Guangdong	22.65334	113.05734	[1,2]
China	Guangxi, Nanning	22.81700	108.36653	[1,3]
China	Guizhou, Anlong	25.09900	105.44269	[4]
China	Hebei	38.71913	114.80067	[1,2]
China	Henan, Jiyuan	35.06725	112.60192	[1,4]
China	Hong Kong	22.37425	114.08477	[5]
China	Hong Kong	22.42819	114.06778	[5]
China	Hubei, Yichang	30.69197	111.28647	[3]
China	Jilin, Tonghua county	41.67981	125.75925	[1,6]
China	Shaanxi	33.99589	107.48343	[1,2]
China	Shanxi	37.27425	111.24516	[1,2]
China	Yunnan, Baoshan	25.11206	99.16175	[7]
China	Yunnan, Kunming	24.88008	102.83289	[7-9]
China	Yunnan, Lufeng	25.15011	102.07903	[10]
China	Yunnan, Mangshi	24.43369	98.58808	[11]
China	Yunnan, Menglian	22.32911	99.58417	[6]
China	Zhejiang, Longquan	28.07464	119.14147	[4]
China	Zhejiang, Daishan	30.26671	122.22394	[1,12]
Korea	Jeongbuk	35.42772	127.13625	[13,14]

Table S2. Geographic records used to infer the ecological niche of bat viruses related toSARS-CoV.

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Supplementary Figure S1. Model performance in geographic space on training data. Ecological niche of bat viruses related to SARS-CoV (SCoVrCs).



Supplementary Figure S2. Model performance in geographic space on training data. Ecological niches of bat viruses closely related to SARS-CoV-2 (SCoV2rCs) predicted using 4 points (data set A).



Supplementary Figure S3. Model performance in geographic space on training data. Ecological niches of bat viruses closely related to SARS-CoV-2 (SCoV2rCs) predicted using 21 points (data set B).

