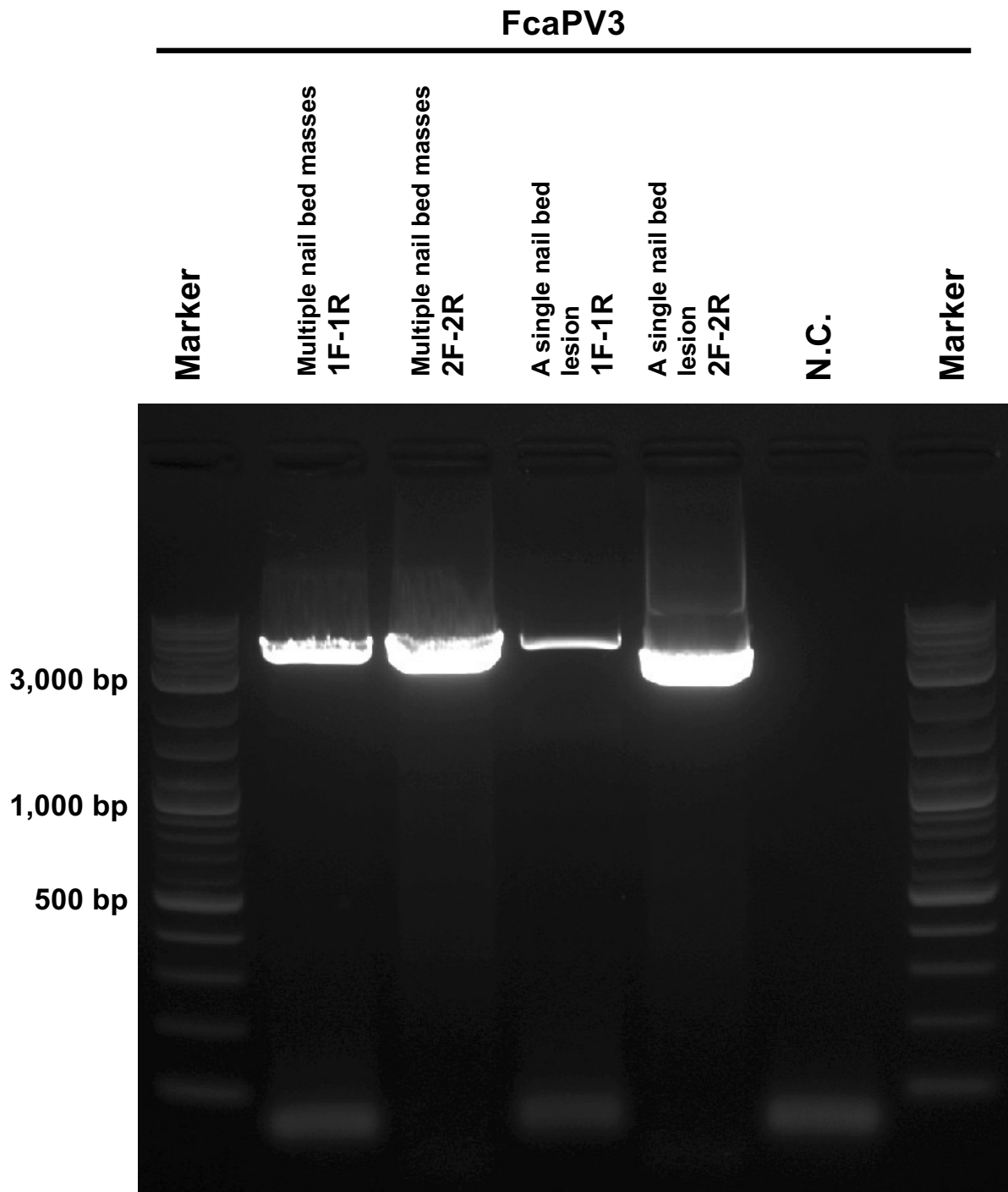
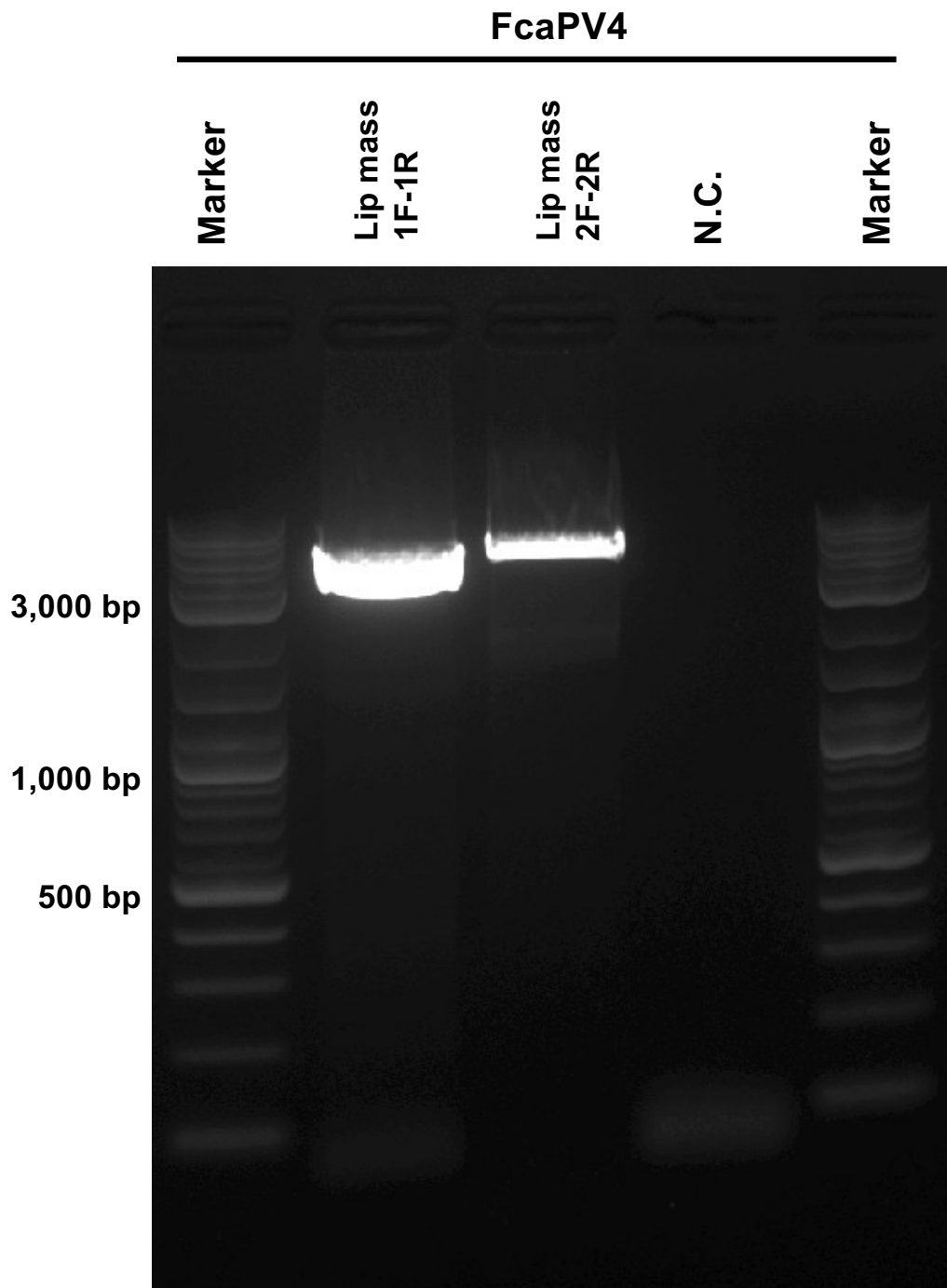


Supplementary Figure 1A



Supplementary Figure 1A. Detection of FcaPV3 by PCR in feline nail bed lesions. Samples were obtained from cases presenting with multiple nail bed masses and a single nail bed lesion. (N.C.: negative control; P.C.: positive control)

Supplementary Figure 1B



Supplementary Figure 1B. Detection of FcaPV4 by PCR in a feline lip lesion. The sample was obtained from a case presenting with a lip mass.

Supplementary Table 1. Primer information**A. Primers used for detecting FcaPV by real-time PCR.**

Primer	Primer sequence (5' to 3')	Accession Number
FcaPV1-F	AGGATGGTGACATGGTGGAT	AF480454
FcaPV1-R	TTTGCACTGTGTGTCTGCAA	
FcaPV2-F	TACACGCGGTACCAATTTCA	EU796884
FcaPV2-R	AGAGTGACCACGCACACTTG	
FcaPV3-F	AAGATTGGTATGGCGTTTGC	JX972168
FcaPV3-R	TTTGCCTTTCATCTGCTGTG	
FcaPV4-F	ATGCAAATGGCCAGACTTTC	KF147892
FcaPV4-R	AAAAATGGCGGCAGTACAAC	
FcaPV5-F	CCGCAAGCAGCCTATTTATTC	NC_035479
FcaPV5-R	CTCCATGTTCTGTCTCCTCTTC	
FcaPV6-F	CAGAGAATCCCACCGCATATAA	KF147892
FcaPV6-R	GGCACACAACCTACAACAATC	
Fel Alb-F	GATGGCTGATTGCTGTGAGA	MN857145
Fel Alb-R	CCCAGGAACCTCTGTTTCATT	

Abbreviations: Fel Alb, *Felis catus Albumin*; FcaPV, feline catus papillomavirus; F, forward; R, reverse.

B. Primers used for Sequencing.

Primer	Primer sequence (5' to 3')
FcaPV-3-1F	GACAGTGCTTAATGTGTCAGAGAGA
FcaPV-3-1R	ATGTGTTCTGTCCTGTGTGTCTTTA
FcaPV-3-2F	AGGAGCCTGAATTTTTATCTAAACC
FcaPV-3-2R	AAAGCTATCTCTGCTTCATCTGTGT
FcaPV-3-Seq1	TTTTATGCAGGGGAAAGTG
FcaPV-3-Seq2	CTGCACTTTGCCAGAAAACA
FcaPV-3-Seq3	GACTACCAGCAACCCACCAG
FcaPV-3-Seq4	AAAAGGATGGGCCTAACAGAA
FcaPV-3-Seq5	TTTGCAAATTGGTGGAAGC
FcaPV-3-Seq6	CGGATGCAGATAAGGGTGTT
FcaPV-3-Seq7	CACAGCAGATGAAAGGCAAA
FcaPV-3-Seq8	GGGGAATCAAATGTTCTCTGA
FcaPV-3-Seq9	CGCCCTTTTTCTGCATAGTC
FcaPV-3-Seq10	AGCCTGCTGTGGAGAAAAAG
FcaPV-3-Seq11	CGGGACCTAACTCAACATGG
FcaPV4-1F	ACAAAGTGGAGGGTCTGGTG

FcaPV4-1R	CTGCTGCCCTCTTAGTGACC
FcaPV4-2F	GTTGTACTGCCGCCATTTTT
FcaPV4-2R	ATTGGGATCGTCCTCTTCCT
FcaPV4-Seq1	AGGAAGAGGACGATCCCAAT
FcaPV4-Seq2	TGTG TTCCTGGAGGTCTTGA
FcaPV4-Seq3	AATTGGTTCGAGCGTCACTT
FcaPV4-Seq4	GGTGACAGTGTGGTGGTGAG
FcaPV4-Seq5	GCAGCCAGTACAGGGTGTTT
FcaPV4-Seq6	GATGTGTGATGTGGGCTTTG
FcaPV4-Seq7	CGCTTTATTGACTCCCTTGC
FcaPV4-Seq8	CACTTAATCCCTGGCTCTGC
FcaPV4-Seq9	GGTGTTCAAGGTGCATGAGA
FcaPV4-Seq10	TGGAGGGTGGTTTTTAGTGC
FcaPV4-Seq11	ATAGGATTGCCACGATGCTC
FcaPV4-Seq12	GATTGGCTGTCAAGGCAAGT
FcaPV4-Seq13	ATTCTGGTTGATGCCCTTG

Supplementary Table 2. Antibodies used for immunohistochemistry

Target	Source	Catalog number	Type (Clone)	Dilution	Antigen Retrieval
p16	BD Pharmingen, Tokyo, Japan	551153	Mouse, monoclonal (G175-405)	1:50	Heat, pH6.0
p63	Nichirei Corporation, Tokyo, Japan	413751	Mouse, monoclonal (4A4)	RU	Heat, pH6.0
p53	Abcam, Cambridge, MA	ab1431	Rabbit, polyclonal	1:100	Heat, pH9.0
pRb	BD Pharmingen, Tokyo, Japan	554136	Mouse, monoclonal (G3-245)	1:40	Heat, pH6.0

Abbreviations: pRb, retinoblastoma protein; RU, ready to use.

Supplementary Table 3. Sequence identity with other FcaPV strains

A. Sequence identity with GNGN/Fukuoka/Japan/2023

Similarity between viral sequences detected from multiple nail bed masses and related sequences previously registered in GenBank.

	LC859345.2_ GNGN3/Fukuoka/Japan/2023 Japan 2023-08-22
NC_021472.1_ MyDave New_Zealand 2010	99.89
LC884935.1_ FcaPV3/cat/Japan/Fukuoka_GNGN3/2024 Japan 2024-02-27	99.68
ON226484.1_ China 2019	64.25
ON226485.1_ China 2019	99.74
ON226486.1_ China 2019	99.72
KY825188.1_ Missouri USA 2012-01	99.87

B. Sequence identity with FcaPV3/cat/Japan/Fukuoka_GNGN3/2024

Similarity between viral sequences detected from a single nail bed lesion and related sequences previously registered in GenBank.

	LC884935.1_ FcaPV3/cat/Japan/Fukuoka_GNGN3/2024 Japan 2024-02-27
NC_021472.1_ MyDave New_Zealand 2010	99.68
LC859345.2_ GNGN3/Fukuoka/Japan/2023 Japan 2023-08-22	99.68
ON226484.1_ China 2019	64.13
ON226485.1_ China 2019	99.92
ON226486.1_ China 2019	99.91
KY825188.1_ Missouri USA 2012-01	99.66

C. Sequence identity with GNGN4/Fukuoka/Japan/2024

Similarity between the virus sequence detected from the ulcerative lesion of the left lip and related sequences previously registered in GenBank.

	% identity with LC859344.1_ GNGN4/Fukuoka/Japan/2024 Japan 2024-02-27
NC_022373.1_ MY-3 New_Zealand 2011	96.62
ON226487.1_ China 2020	96.60
LC333412.2_ 13136 Japan 2013	98.59
LC333413.2_ 141110 Japan 2014	96.86

Supplementary Table 4. DNA probes used for detecting the E6 region of FcaPV3 and FcaPV4

The probe target sequences are underlined.

Target-specific probe for:	Probe sequences
FcaPV3 E6	<u>ATGGCGAAGCAGAACTCCTTCGCGGGGATAGCCGAGCTGCTCGGAGT</u> <u>TCCCGCAGAGTGTATCCTTGTTCAATGTTGCTTTTGTGGGAGATGGAT</u> <u>GACCGAAAGGGATAAAATAGACTTTGATTTTAAAAAGTTGGGTTTGAT</u> <u>TTTACAGAATAGACAGTTATTGGGTGCCTGTACAGCCTGCTGTGGAGA</u> <u>AAAAGCTGCTGCAGACGTTAGAGCAAATACTACATGTTGTCTGGAGA</u> <u>TTGATGGTGCTTGCGCATTGTCAGGAAAATCTGTTTGTGCTTTGCCAG</u> <u>TTCGGTGACAGTGTGCTTAAAAGAGCTTACTCTCACAGAGAAGTTA</u> <u>GACTGCTGCGCTGCCAGGGTACCCTTACAGTTAGTCAGAGGTGTGTG</u> <u>GCGCGGACCCTGTCGCTTATGCTTTAGAGGATGA</u>
FcaPV4 E6	<u>ATGGCGAAGCCTACCTCCGTCGCGGGCGTTTGCGGGCGTTTGGGGAT</u> <u>TTCTGTTGCTCGTATCCTTGTGAAATGCTGTTTTTGTGGGAATTATCTT</u> <u>TCGGAGACAGATAAGATCGCTTTCGATTTC AAGGATTTAGGGCTTTTT</u> <u>GTAAGAGGAGGAAGGCTGCTTGGGATATGTGAGAGATGTTGTTTATT</u> <u>GCGCTCTGCCAGCGACTGCGCAAGCAACATTAAGTGTTGTTTGGAA</u> <u>TGGATGGGGTCTTAAAATTTACTGGGGAAAGTTTGGA AAACTTGGTG</u> <u>GTGCGGTGTTCAAGGTGCATGAGAAAACTGAGTGTA ACTGAAAAATT</u> <u>AGCTTGCTGGTATCAAAGAGAGCCACTAGTGCTTGTACGTGACTATTG</u> <u>GAGAGGGTGTTGCCGATTGTGTAGGTTACCATGA</u>