



Food and Agriculture
Organization of the
United Nations

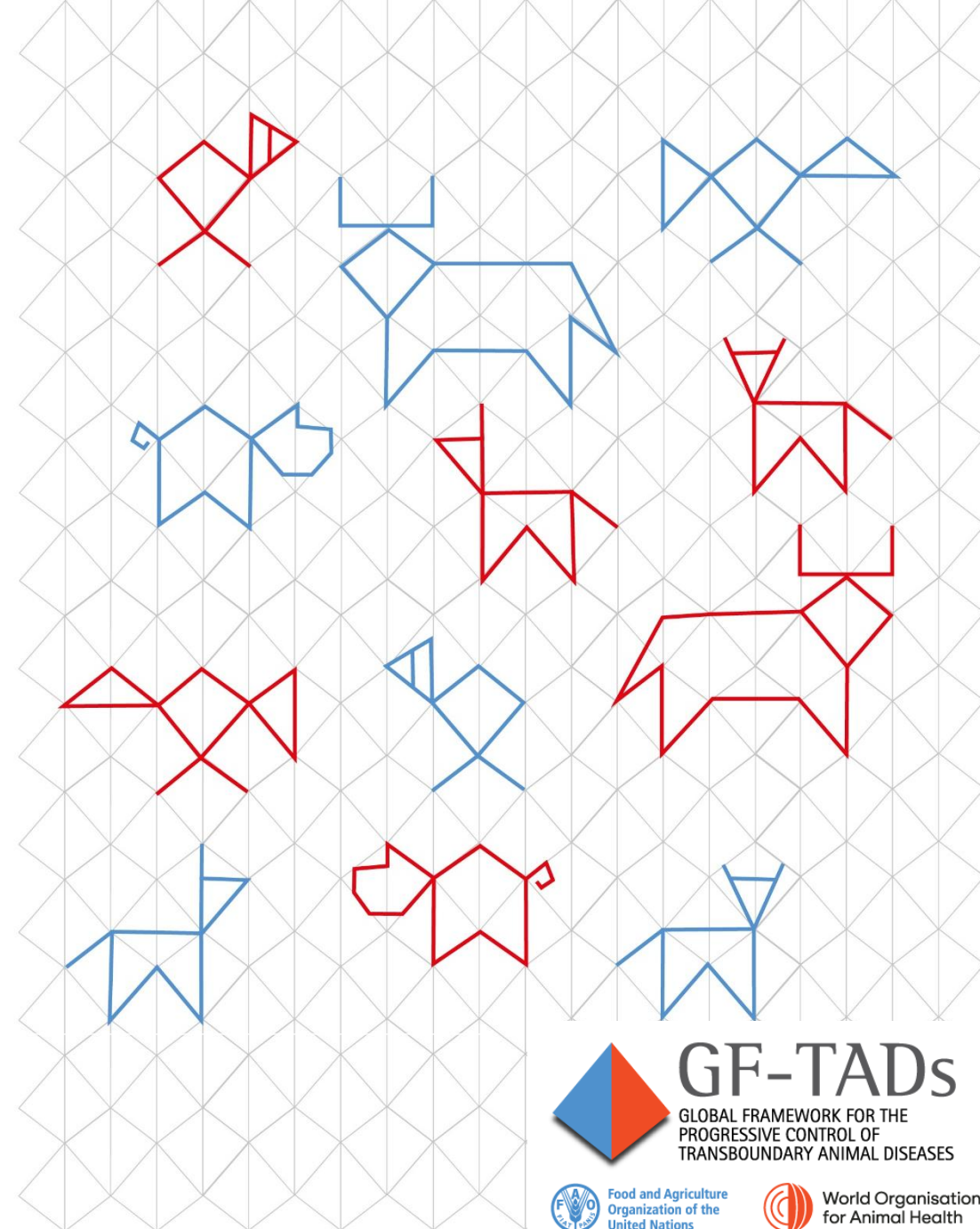


World Organisation
for Animal Health

Eleventh Meeting of the Standing Group of Experts on African Swine Fever for Asia and the Pacific

Seoul Republic of Korea

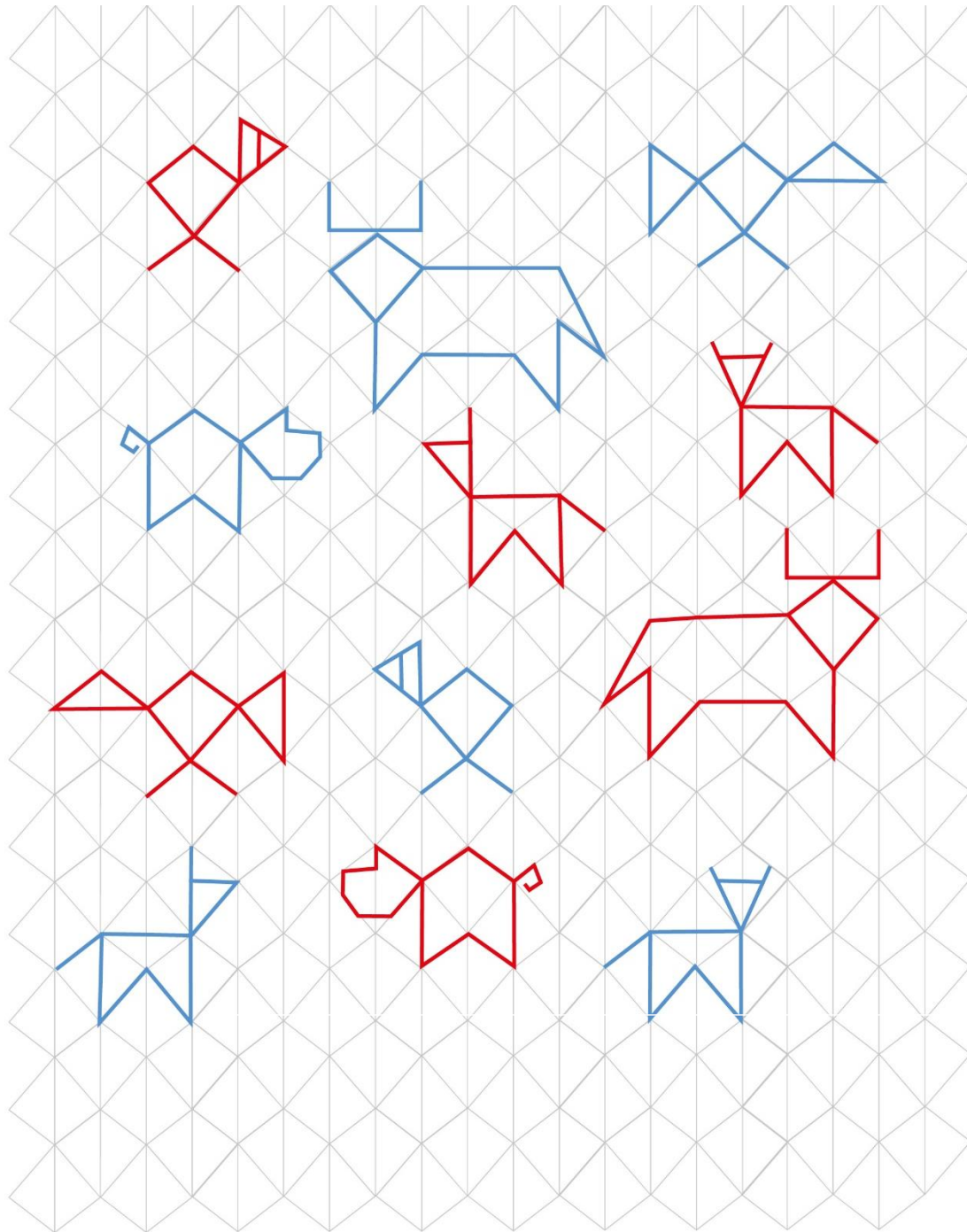
11 – 13 August 2026



Food and Agriculture
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for Animal Health



GF-TADs

GLOBAL FRAMEWORK FOR THE
PROGRESSIVE CONTROL OF
TRANSBOUNDARY ANIMAL DISEASES



Food and Agriculture
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United Nations



World Organisation
for Animal Health

**Private sector – led
whole – genome sequencing
complementing government
surveillance**

Homer Pantua, DVM, PhD

President  **BioAssets**

Roselle Falconite – Cudal, DVM, FPCSP

Fellow



PHILIPPINE COLLEGE OF
SWINE PRACTITIONERS

2024

2025

2026



PHILIPPINE COLLEGE OF
SWINE PRACTITIONERS



- September
 - Initial discussion with laboratory
- October
 - PCSP samples started submission and testing at BioAssets

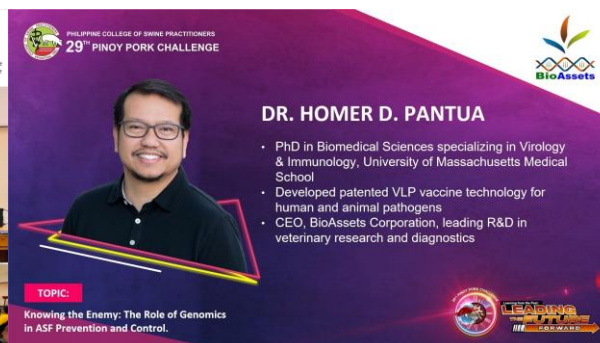
- February
 - MOU signing PCSP and BioAssets
- April
 - Summary Report released
- June
 - BAI meeting and presentation of results
- October
 - Pinoy Pork Challenge
 - Transfer of 2025 samples to BAI PAHC from BioAssets
- November
 - Poster, APVS 2025, Japan

- February
 - Presentation, PVMA 93
 - Presentation, IFS 2026
- June
 - Poster, IPVS 2026 Vietnam
- July
 - Presentation, Livestock 2026, Manila
 - Presentation, Critical Thinking Session, PCSP Meeting



PCSP-BioAssets
MOU Signing

PCSP-BAI
Alignment



PPC
Presentation

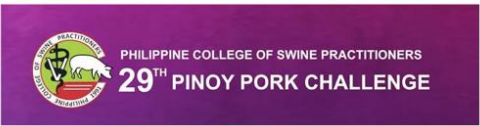


APVS
Presentation



IPVS
Presentation

Data Sharing and Sustained Collaboration

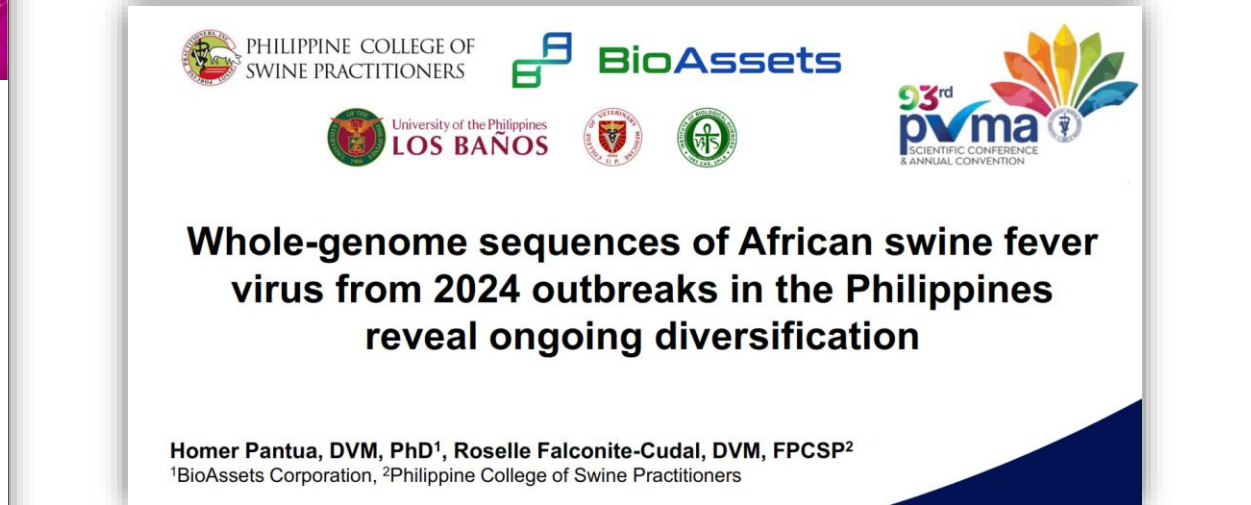
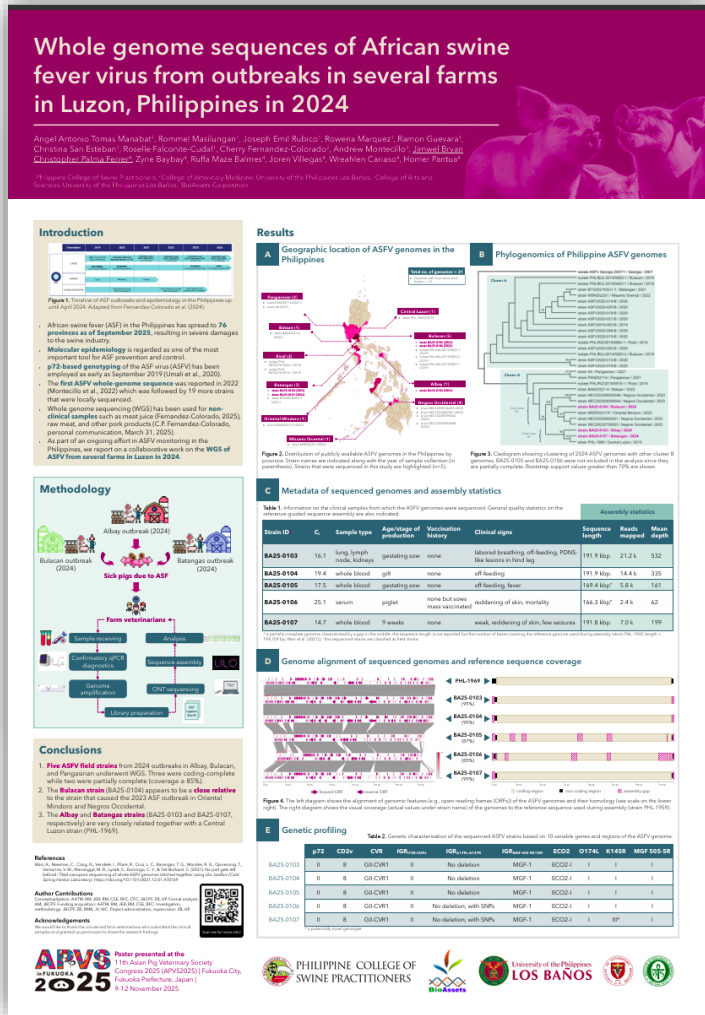


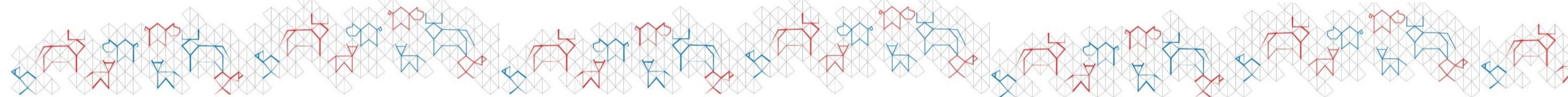
Knowing the Enemy:

The Role of Genomics in ASF Prevention and Control

Homer Pantua, DVM, PhD

Roselle Falconite-Cudal, DVM, FPCSP





Emerging Genetic Diversity of African Swine Fever Virus in the Philippines: Insights from Whole Genome Sequencing of 2019-2026 Outbreaks

Homer Pantua, DVM, PhD¹, Roselle Falconite-Cudal, DVM, FPCSP³

Jimwel Bryan Christopher Ferrer¹, Zyne Baybay¹, Ruffa Maze Balmes¹, Joren Villegas¹, Earl Bryant Cordova¹, Wreahlen Cariaso¹, Andrew Montecillo²,
Angel Antonio Tomas Manabat³, Rommel Masilungan³, Joseph Emil Rubico³, Rowena Marquez³, Ramon Guevara³, Christina San Esteban³

¹BioAssets Corporation, ²Institute of Biological Sciences, University of the Philippines Los Baños, ³Philippine College of Swine Practitioners,



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BioAssets



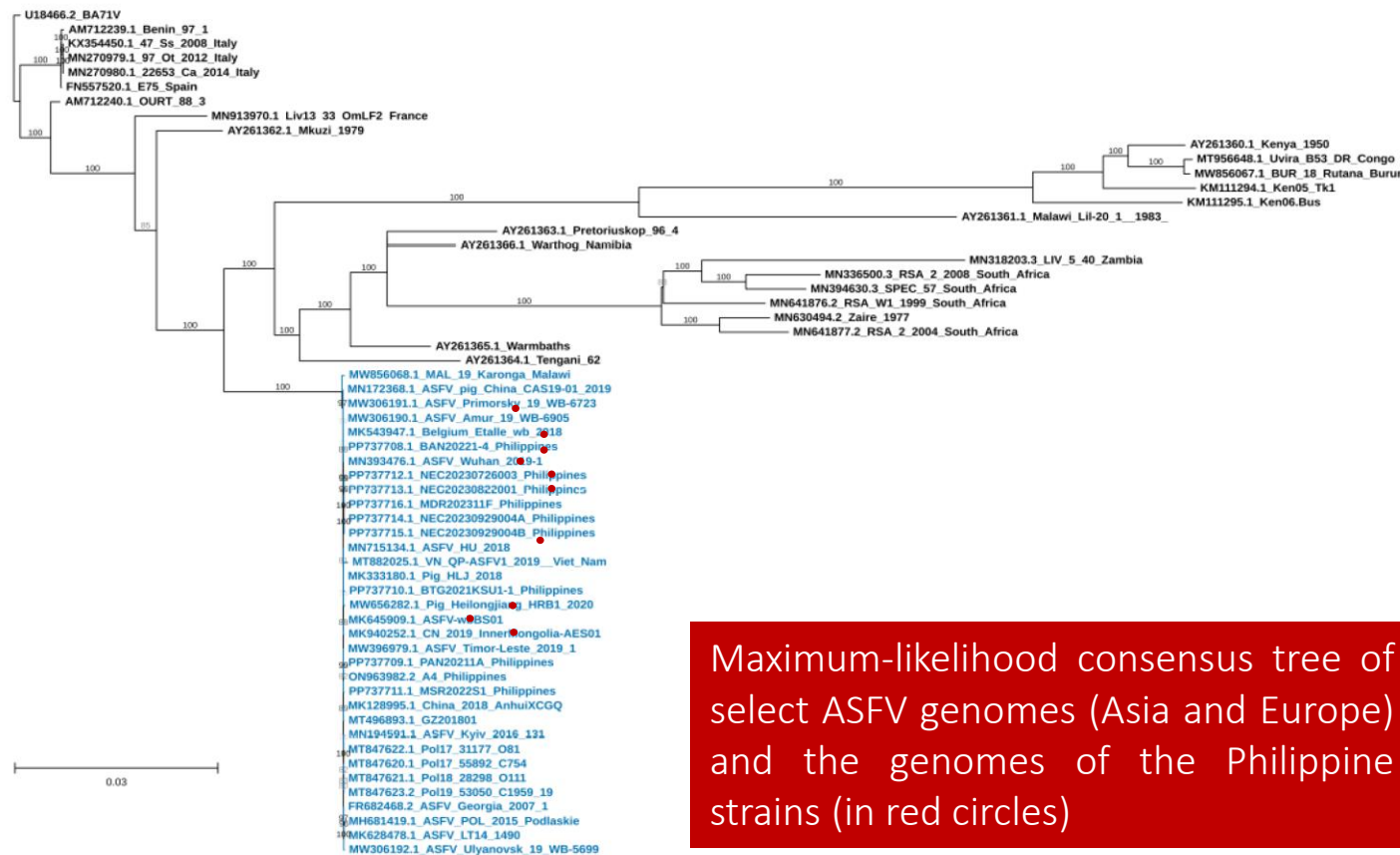
University of the Philippines
LOS BAÑOS

Virus Blueprint

ASF virus strains clustered together with p72 genotype II (2021 – 2023)



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Coding-Complete Genome Sequence of an African Swine Fever Virus from an Outbreak in 2021 among Domestic Pigs in Pangasinan, Philippines

Andrew D. Montecillo,^a Zyne Baybay,^b Ralph Carolyn Cabug,^b Wreahlen Cariaso,^b John Paulo Jose,^c Sheila Mantaring,^c Annabelle Briones,^c Amanda Warr,^d Christine Burkard,^d Lucille Villegas,^a Homer Pantua^{ab}

^aMicrobiology Division, Institute of Biological Sciences, University of the Philippines Los Baños, Los Baños, Philippines

^bBioAssets Corporation, City of Santo Tomas, Batangas, Philippines

^cIndustrial Technology Development Institute, Department of Science and Technology (DOST-ITDI), Bicutan, Taguig City, Philippines

^dThe Roslin Institute and Royal (Dick) School of Veterinary Studies, University of Edinburgh, United Kingdom

Genetic Profiles of Ten African Swine Fever Virus Strains from Outbreaks in Select Provinces of Luzon, Visayas, and Mindanao, Philippines, Between 2021 and 2023

Andrew D. Montecillo ^{1,2,*}, Zyne K. Baybay ¹, Jimwel Bryan Christopher Ferrer ¹, Wreahlen Cariaso ¹, Airish Pantua ¹, John Paulo Jose ³, Rachel Madera ⁴, Jishu Shi ⁴, Karla Cristine Doysabas ⁵, Alan Dargantes ⁵, Kassey Alsylle T. Dargantes ⁵, Anna Rochelle A. Boongaling ⁶, Alfredo P. Manglicmot ⁶, Lucille C. Villegas ² and Homer D. Pantua ^{1,2,*}

Maximum-likelihood consensus tree of select ASFV genomes (Asia and Europe) and the genomes of the Philippine strains (in red circles)

Genome features of ASFV isolates

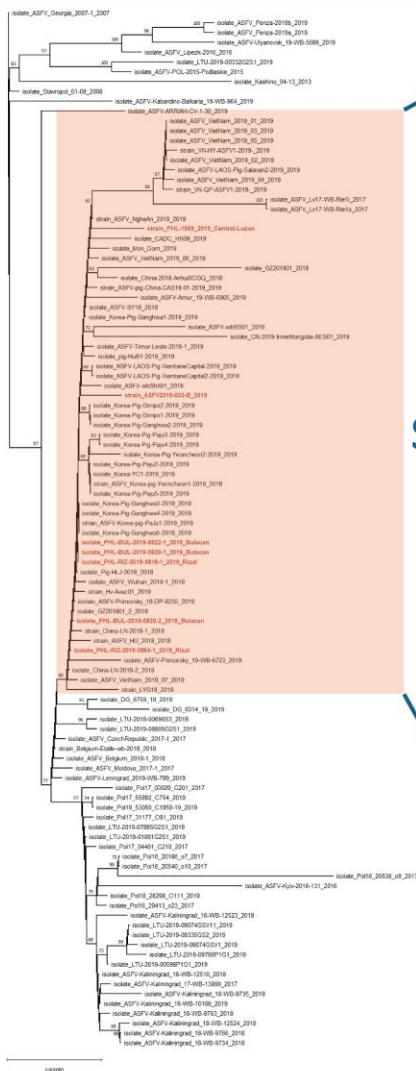


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Strain	p72 Genotype	CD2v Serogroup	CVR	IGR _{I73R- I329L}	IGR _{A179L-A137R}	IGR _{MGF 505 9R/10R}	ECO2	O174L	K145R	MGF 505- 5R	Bt/Sj	CP204L	J268L
Philippines/BAN20221-4/2022	II	8	CVR1	II	No deletion	MGF-1	ECO2-I	I - with deletion	I	I	100%	100%	100%
Philippines/PAN20211A/2021	II	8	CVR1	II	No deletion	MGF-1	ECO2-I	I - with deletion	I	I	100%	100%	100%
Philippines/BTG2021KSU1-1/2021	II	8	CVR1	II	No deletion	MGF-1	ECO2-I	I - with deletion	I	I	100%	1 base substitution (A- to-G)	1 base substitution (G- to-A)
Philippines/MSR2022S1/2022	II	8	CVR1	II	No deletion	MGF-1	ECO2-I	I - with deletion	I	I	100%	100%	100%
Philippines/NEC20230726003/2023	II	8	CVR1	II	No deletion; with SNPs	MGF-1	ECO2-I	I - with deletion	I	I	100%	100%	100%
Philippines/NEC20230822001/2023	II	8	CVR1	II	No deletion; with SNPs	MGF-1	ECO2-I	I - with deletion	I	I	100%	100%	100%
Philippines/NEC20230929004A/2023	II	8	CVR1	II	No deletion; with SNPs	MGF-1	ECO2-I	I - with deletion	I	I	100%	100%	100%
Philippines/NEC20230929004B/2023	II	8	CVR1	II	No deletion; with SNPs	MGF-1	ECO2-I	I - with deletion	I	I	100%	100%	100%
Philippines/MDR202311F/2023	II	8	CVR1	II	No deletion; with SNPs	MGF-1	ECO2-I	I - with deletion	I	I	100%	100%	100%
Philippines/A4/2021	II	8	CVR1	II	No deletion	MGF-1	ECO2-I	I - with deletion	I	I	100%	100%	100%

**PH isolate
stemmed from
China Outbreak.
PH Sequences
clustered in
subclade IIA.**

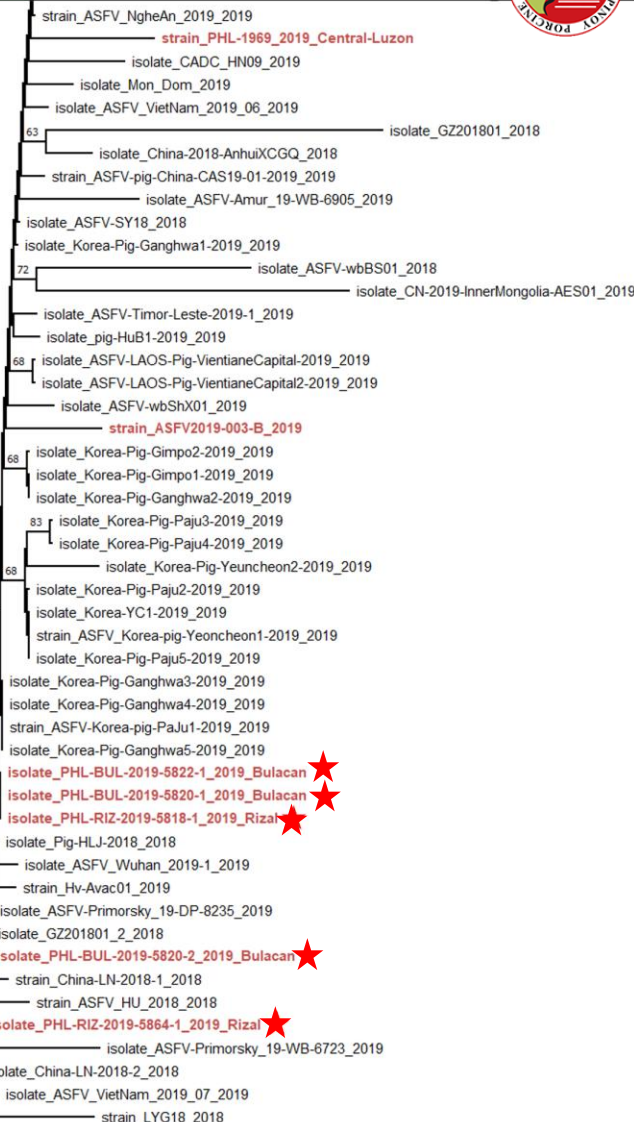
**2019
ASFV
Isolates
Index
cases**



Subclade IIA



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★ Index Case
by BAI and
Pirbright

- PH sequences
do not cluster
together.
- Separate
introductions?

2024 PCSP Surveillance Initiative



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Total samples: 43 animals

Locality: South and North Luzon

Clinical signs: Off-feeding, Fever, Weakness, Seizure,
Redding of Skin

Proceeded to WGS: 6 (based on grouping and Ct values)

Sample ID	Sample type	C _t	Genome completeness	Classification	Isolate ID
01	lung, lymph node	15.4	coding-complete	?	BA25-0102
02	lung, lymph node, kidneys	16.1	coding-complete	field strain ★	BA25-0103
03	whole blood	17.5	partially complete	field strain	BA25-0105
04	serum	25.1	partially complete	field strain	BA25-0106
05	whole blood	14.7	coding-complete	field strain ★	BA25-0107
06	whole blood	19.4	coding-complete	field strain ★	BA25-0104

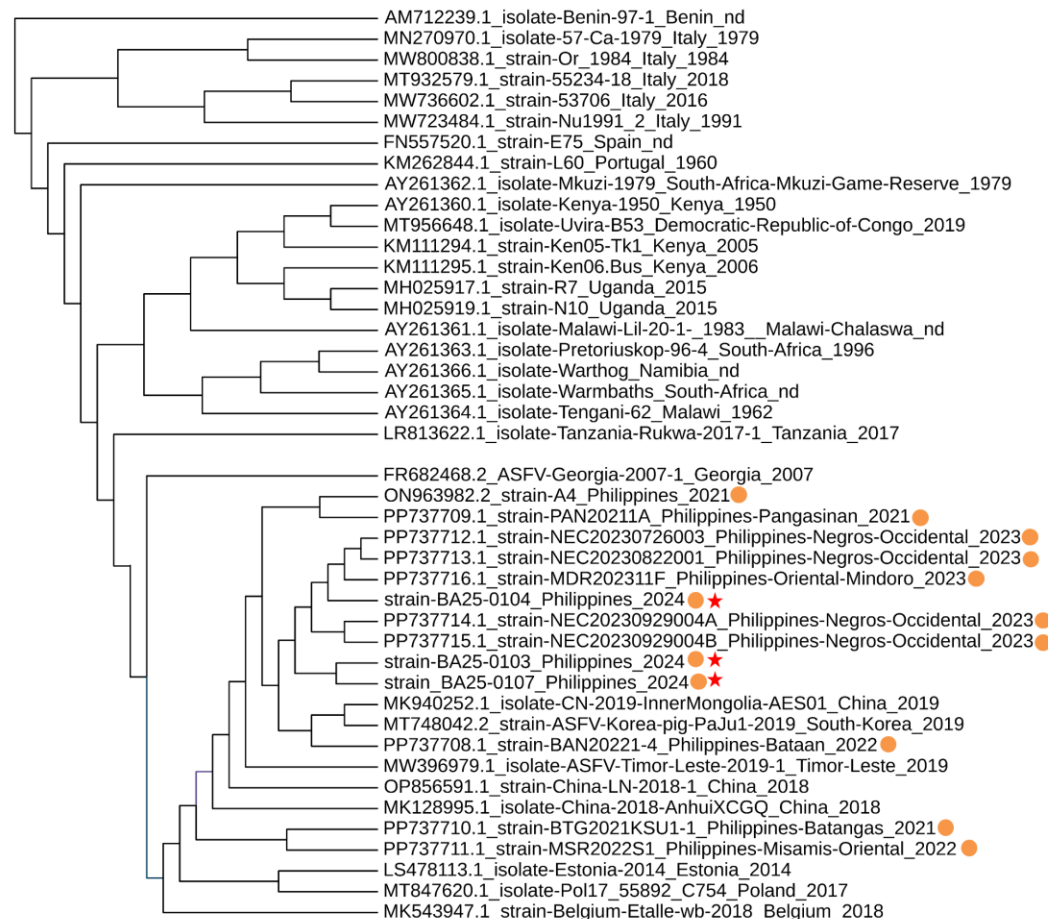
2024 PCSP Surveillance Initiative

*ASF virus strains
still clustered
with p72
genotype II
strains*



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SWINE PRACTITIONERS

Maximum-likelihood consensus tree of sequenced ASFV coding-complete genomes and select ASFV genomes classified based on the p72 genotype. The tree is rooted using isolate Benin 97/1 as the outgroup.



Genotype I

Genotype VII

Genotype X

Genotype IX

Genotype VIII

Genotype IV

Genotype V

Genotype XX

Genotype III

Genotype II

● Philippine sequences
★ 2024 PH sequences

Geographic Location of ASFV Isolates

*No. of genomes: 31
(2019 to 2024)*

Pangasinan (2)

- strain PAN2021 1A (2021)
- strain A4 (2021)

Bataan (1)

- strain BAN20221-4 (2022)

Rizal (2)

- isolate PHL/RIZ/2019/5864-1 (2019)
- isolate PHL/RIZ/2019/5818-1 (2019)

Batangas (3)

- strain BA25-0105 (2024)
- strain BA25-0107 (2024)
- strain BTG2021KSU1-1 (2021)

Oriental Mindoro (1)

- strain MDR20231 1F (2023)

Misamis Oriental (1)

- strain MSR2022S1 (2022)

Central Luzon (1)

- strain PHL-1969 (2019)

Bulacan (5)

- strain BA25-0104 (2024)
- strain BA25-0106 (2024)
- isolate PHL/BUL/2019/5820-1 (2019)
- isolate PHL/BUL/2019/5820-2 (2019)
- isolate PHL/BUL/2019/5822-1 (2019)

Albay (1)

- strain BA25-0103 (2024)

Negros Occidental (4)

- strain NEC20230726003 (2023)
- strain NEC20230822001 (2023)
- strain NEC20230929004A (2023)
- strain NEC20230929004B (2023)

Virus Tracking

- Trade activities
- Virus genome clustering
- Suggestive of spread from Bacolod to Mindoro

Oriental Mindoro (1)

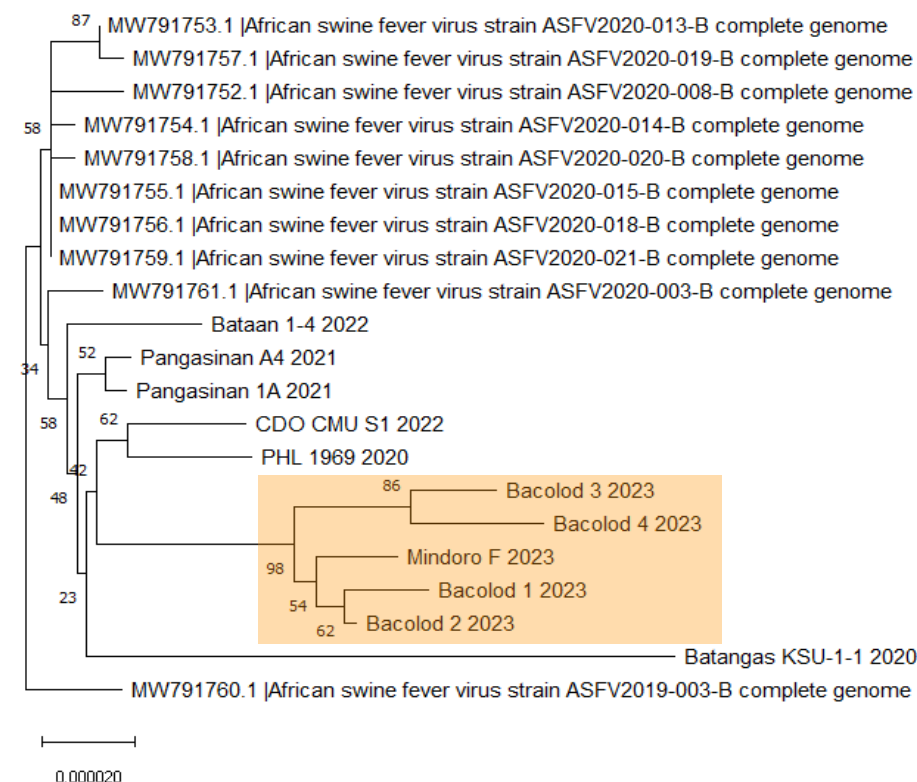
- strain MDR202311F (2023)

Negros Occidental (4)

- strain NEC20230726003 (2023)
- strain NEC20230822001 (2023)
- strain NEC20230929004A (2023)
- strain NEC20230929004B (2023)

Genetic Profiles of Ten African Swine Fever Virus Strains from Outbreaks in Select Provinces of Luzon, Visayas, and Mindanao, Philippines, Between 2021 and 2023

Andrew D. Montecillo ^{1,2,*}, Zyne K. Baybay ¹, Jimwel Bryan Christopher Ferrer ¹, Wreahlen Cariaso ¹, Airish Pantua ¹, John Paulo Jose ³, Rachel Madera ⁴, Jishu Shi ⁴, Karla Cristine Doysabas ⁵, Alan Dargantes ⁵, Kassey Alsylle T. Dargantes ⁵, Anna Rochelle A. Boongaling ⁶, Alfredo P. Manglicmot ⁶, Lucille C. Villegas ² and Homer D. Pantua ^{1,2,*}



Virus Tracking

Oriental Mindoro (1)

- strain MDR202311F (2023)

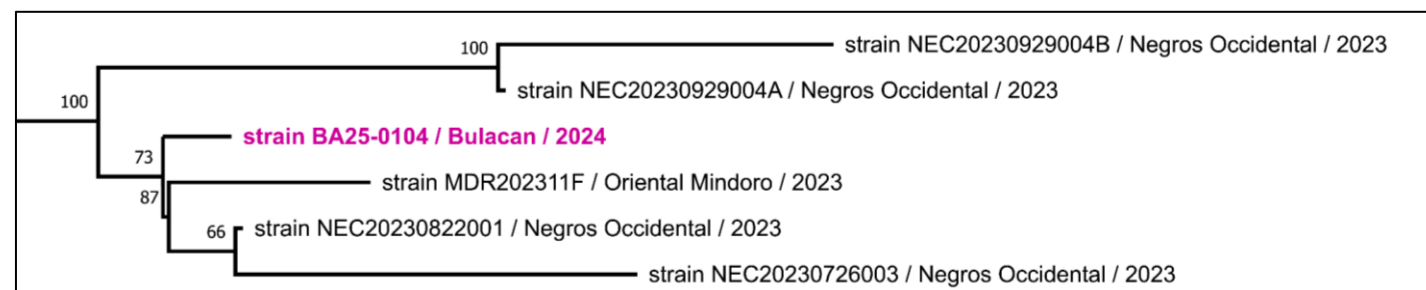
Bulacan (1)

- strain BA25-0104 (2024)

Negros Occidental (4)

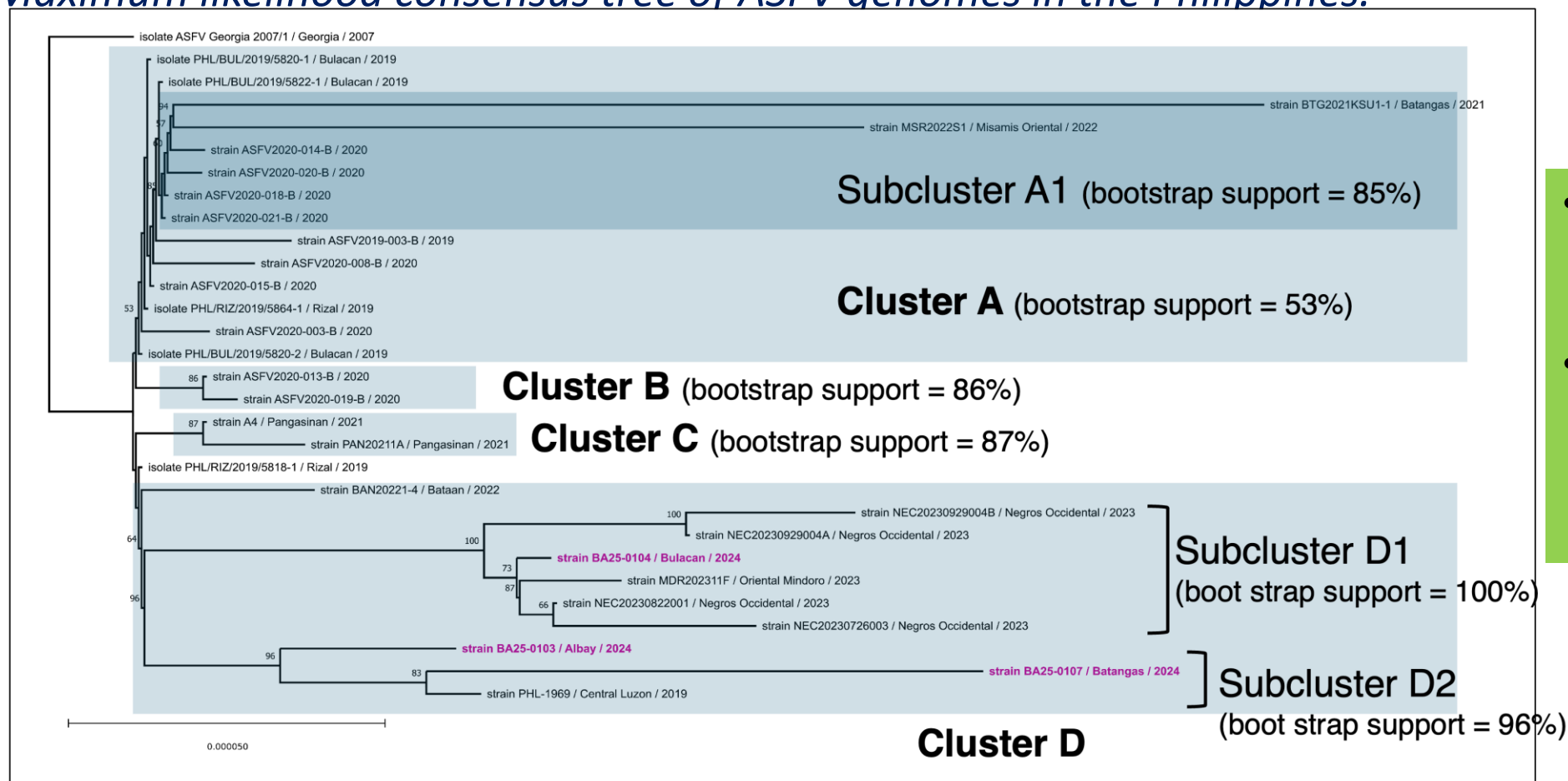
- strain NEC20230726003 (2023)
- strain NEC20230822001 (2023)
- strain NEC20230929004A (2023)
- strain NEC20230929004B (2023)

Where did the 2024 Bulacan case originate?



Diversification of ASFV Isolate Sequences

Maximum likelihood consensus tree of ASFV genomes in the Philippines.



- year-on-year genomic data from 2019 to 2024
- ASFV characteristics per cluster?
 - Transmissibility
 - Virulence

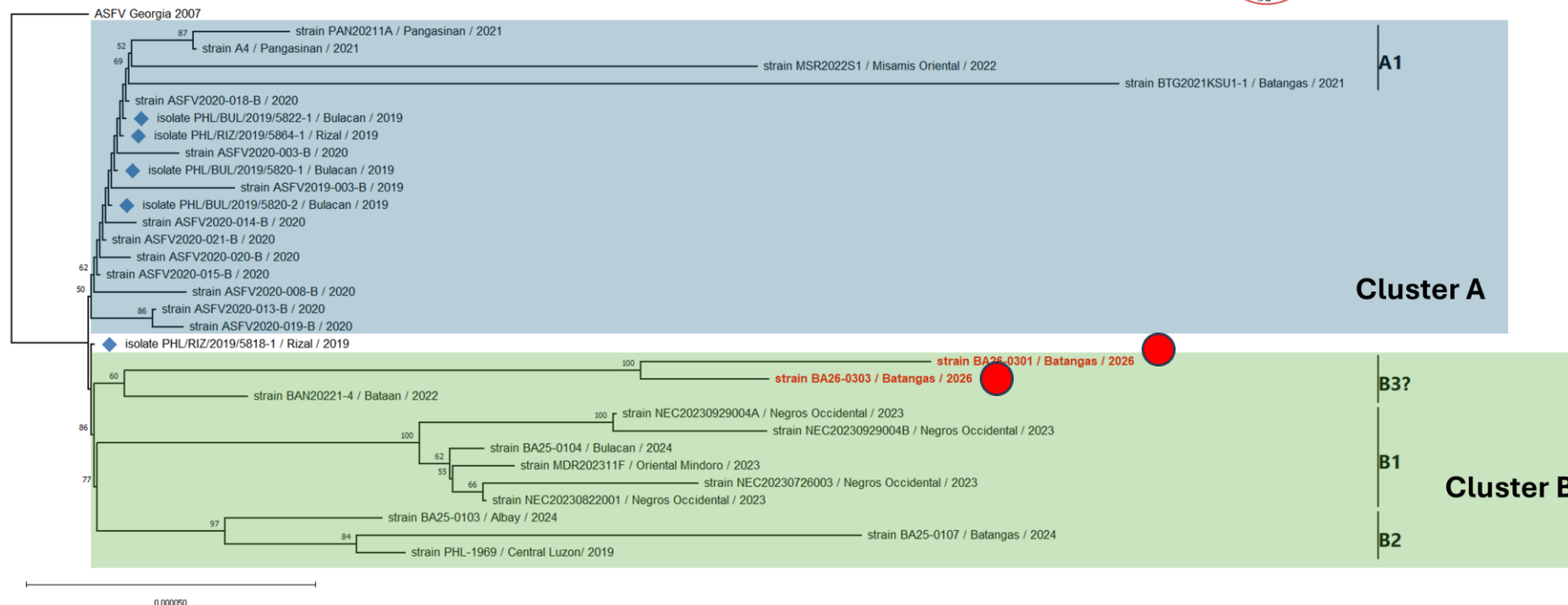
Where are we in 2026?

PCSP samples from outbreaks from Central Luzon and Southern Tagalog.

Total samples: 12 animals
Proceeded to WGS: 3

Farm #	Geographic location	Year	Sample type	C _t	Genome completeness	Classification	Isolate ID
01	Batangas	2026	whole blood	22.4	coding-complete ●	GII field strain	BA26-0301
02	Pampanga	2026	whole blood	16.7	partially complete ●	GII field strain	BA26-0302
03	Batangas	2026	whole blood	17.9	coding-complete ●	GII field strain	BA26-0303
04	North Luzon	2024	lung, lymph nodes	15.4	coding-complete	?	BA25-0102
05	no data	2025	spleen	28.0	coding-complete	??	BA25-1103
06	Tarlac	2026	Whole blood	24.8	coding-complete	???	BA26-0304

New virus characterist?



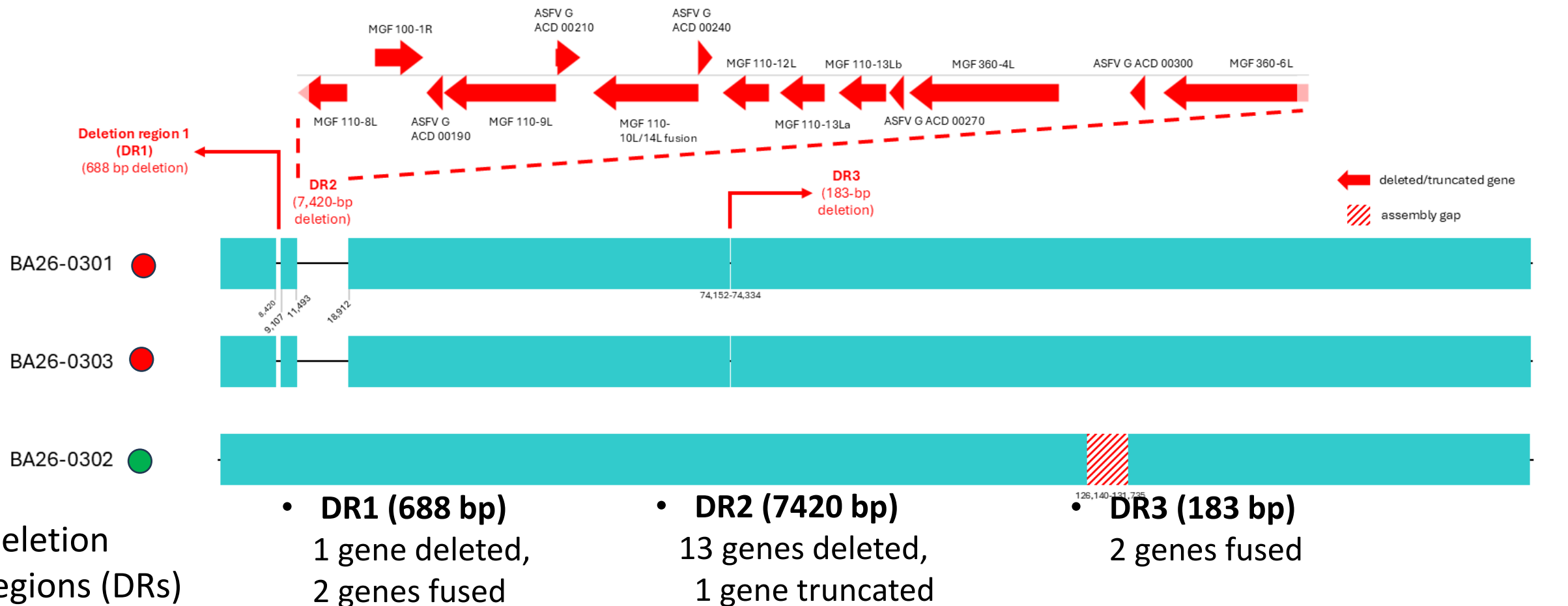
Isolate ID	Farm #	Geographic location	Genome completeness	Classification	Clinical signs	Observed incubation period	Observed transmissibility
BA26-0301	01	Batangas	coding-complete	GII field strain	off-feed, sick	slow onset	slow spread
BA26-0302	02	Pampanga	partially complete	GII field strain	off-feed, high fever	quick onset	fast spread
BA26-0303	03	Batangas	coding-complete	GII field strain	off-feed, sick	slow onset	slow spread

A new case of major structural mutation...



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Georgia2007/1



What else is out there???

ASF vaccine-like strains in the Philippines

Farm #	Geographic location	Year	Sample type	C _t	Genome completeness	Classification	Isolate ID
01	Batangas	2026	whole blood	22.4	coding-complete ●	GII field strain	BA26-0301
02	Pampanga	2026	whole blood	16.7	partially complete ●	GII field strain	BA26-0302
03	Batangas	2026	whole blood	17.9	coding-complete ●	GII field strain	BA26-0303
04	North Luzon	2024	lung, lymph nodes	15.4	coding-complete ★	Vaccine-like	BA25-0102
05	Batangas	2025	spleen	28.0	coding-complete ★	Vaccine-like	BA25-1103
06	Tarlac	2026	Whole blood	24.8	coding-complete ★	Vaccine-like	BA26-0304

Historical reports of vaccine-like strains

September 2021, Hung Yen, Vietnam

- No vaccines approved in Vietnam during this period
- ASFV-G-ΔMGF vaccine-like strain
- Experimentally tested to be virulent in piglets but showed to induce protection when challenged by highly virulent homologous strain

April 2023, Vinh Phuc, Vietnam

- Finishing pigs, non-vaccinating
- Chronic ASF: fever, anorexia, lethargy, low mortality
- Non-hemadsorbing ASFV-G-ΔI177L vaccine-like strain

September-November 2023, Southern Vietnam

- Breeding pigs, non-vaccinating
- Reproductive failure, multiple ulcerative dermatitis observed
- ASFV-G-ΔMGF vaccine-like strain with novel gene deletions



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 **viruses** 

Article

Characterization of an African Swine Fever Virus Field Isolate from Vietnam with Deletions in the Left Variable Multigene Family Region

Aruna Ambagala ^{1,2,3,*}, Kalhari Goonewardene ¹, Ian El Kanoa ¹, Thi Tam Than ⁴, Van Tam Nguyen ⁵, Thi Ngoc Ha Lai ⁴, Thi Lan Nguyen ⁴, Cassidy N. G. Erdelyan ¹, Erin Robert ^{1,2}, Nikesh Tailor ¹, Chukwunonso Onyilagha ¹, Lindsey Lamboo ¹, Katherine Handel ¹, Michelle Nebroski ¹, Oksana Vernygora ¹, Oliver Lung ¹ and Van Phan Le ^{4,*}

 **viruses** 

Article

Emergence of Non-Hemadsorbing African Swine Fever Virus Genotype II Variants and the Evolution of a Vaccine-Derived Strain in Vietnam

Thi Chau Giang Tran ^{1,2}, Thi Tam Than ², Thi Ngoc Ha Lai ³, Hoang Duc Le ⁴, Trong Tung Nguyen ⁵, Ngoc Duong Vu ^{1,2}, Ngoc Bao Anh Ngo ^{1,2}, Hoai Thuong Nguyen ^{1,2}, Phuong Anh Nguyen ^{1,2}, Kalhari Goonewardene

scientific reports

OPEN **An African swine fever vaccine-like variant with multiple gene deletions caused reproductive failure in a Vietnamese breeding herd**

Thanh Che Nguyen^{1,2,4,11}, Nga To Thi Bui^{3,11}, Lua Thi Nguyen³, Tram Ngoc Thi Ngo⁴, Cuong Van Nguyen⁴, Luan Minh Nguyen⁴, Janin Nouhin⁵, Erik Karlsson⁵, Pawin Padungtod⁶, Nakarin Pamornchainavakul⁷, Sawang Kesdangsakonwut^{2,8,9}, Roongroje Thanawongnuwech^{2,10} & Duy Tien Do^{4,12}

Historical reports of vaccine-like strains

July–November 2023, Vietnam

- non-vaccinating
- No info on clinical signs
- ASFV-G-ΔMGF and ASFV-G-ΔI177L vaccine-like strains showing increased diversity
- Harbored non-synonymous SNPs, deletions in EP153R-EP402R gene and insertion in E183L gene

October 2024, Western Region, Thailand

- Finishing pigs, non-vaccinating
- Chronic ASF: chronic respiratory disease, joint swelling, slow weight gain, sporadic deaths
- ASFV-G-ΔMGF vaccine-like strain

2024–2025, Western Region, Thailand

- Posters in APVS, IPVS
- non-vaccinating
- Some showing ASF clinical signs
- ASFV-G-ΔMGF vaccine-like strain with novel 688-bp deletion suggesting recombination with field strain



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RESEARCH ARTICLE OPEN ACCESS

Subtle Genetic Shifts of African Swine Fever Virus Among Vietnamese Domestic Swine Following Live-Attenuated Vaccine Commercialization

Thanh Che Nguyen^{1,2} | Phakawat Tantitaveewattana^{2,3} | Nakin Pamornchainavakul⁴ | Duy Tien Do⁵ | Roongtham Kedkovid^{6,7} | Roongroje Thanawongnuwech^{2,8}

EMERGING INFECTIOUS DISEASES®

Volume 32, Number 2—February 2026

Research Letter

Vaccine-Like African Swine Fever Virus Strain in Domestic Pigs, Thailand, 2024

Trong Tung Nguyen, Dhithya Venkateswaran, Anwesha Prakash, Quynh Anh Nguyen, Roypim Suntisukwattana, Anan Jongkaewwattana, Theeradej Thaweerattanasin, Janya Saenboonrueng, Van Phan Le, and Dachrit Nilubol



The Emergence of an African Swine Fever Virus Combining Vaccine-like and Field Strain Characteristics in Non-Vaccinated Pigs

Dachrit Nilubol¹, Trong Tung Nguyen¹, Dhithya Venkateswaran¹, Roypim Suntisukwattana¹, Anan Jongkaewwattana²



GENOMIC CHANGES IN VACCINE-LIKE AFRICAN SWINE FEVER VIRUS FIELD ISOLATES FROM SOUTHEAST ASIA

Trong Tung Nguyen¹, Dhithya Venkateswaran¹, Roypim Suntisukwattana¹, Anan Jongkaewwattana², Theeradej Thaweerattanasin¹, Janya Saenboonrueng², Dachrit Nilubol¹

¹Swine Viral Evolution and Vaccine Development Research Unit, Department of Veterinary Microbiology, Faculty of Veterinary Science, Chulalongkorn University, Bangkok, Thailand.

²National Center for Genetic Engineering and Biotechnology (BIOTEC), Pathum Thani 12120, Thailand.

*Email of corresponding author: dachrit@gmail.com

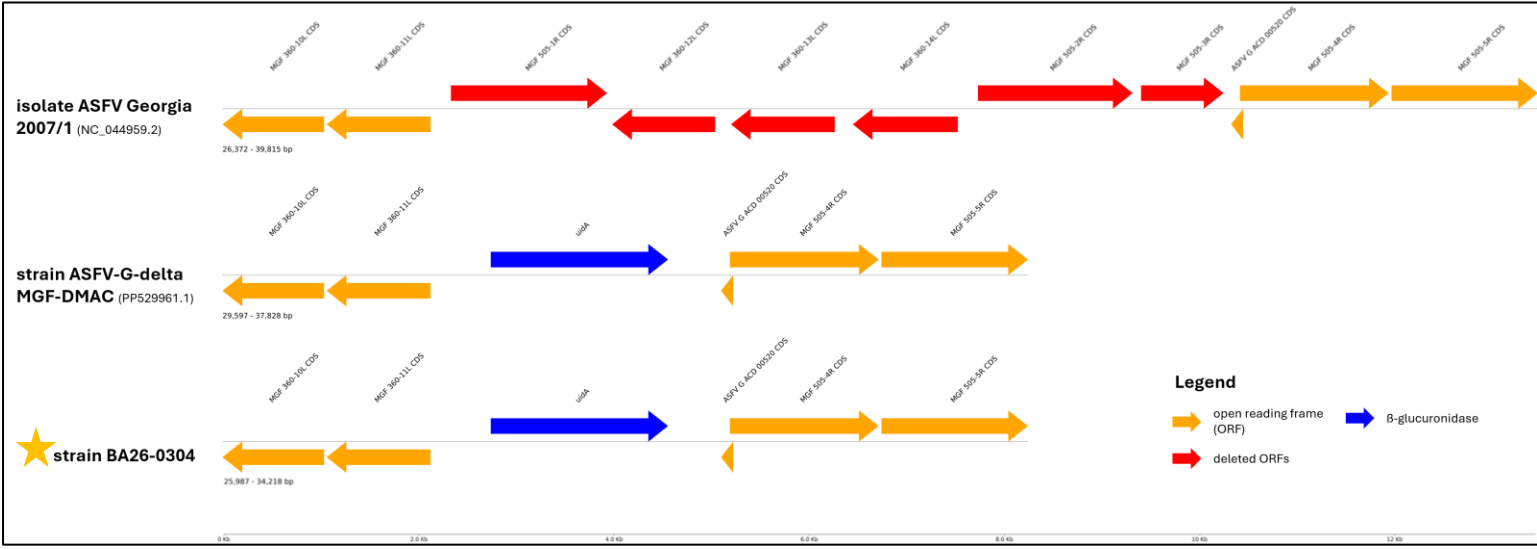


ASF vaccine-like strains in the Philippines

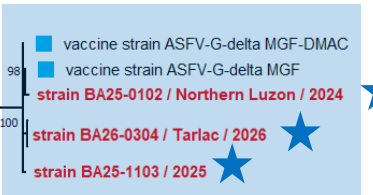


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Presence of *gusA* gene vaccine marker



ASFV Georgia_2007/01



Clustering of isolates with ASFV-G-ΔMGF

- strain ASFV2020-020-B / 2020
- strain ASFV2020-021-B / 2020
- strain ASFV2020-014-B / 2020
- strain MSR2022S1 / Misamis Oriental / 2022
- strain BTG2021KSU1-1 / Batangas / 2021
- ◆ isolate PHL/BUL/2019/5820-1 / Bulacan / 2019
- strain ASFV2020-003-B / 2020
- ◆ isolate PHL/BUL/2019/5822-1 / Bulacan / 2019
- ◆ isolate PHL/RIZ/2019/5864-1 / Rizal / 2019
- strain PAN20211A / Pangasinan / 2021
- strain A4 / Pangasinan / 2021
- strain ASFV2019-003-B / 2019
- ◆ isolate PHL/BUL/2019/5820-2 / Bulacan / 2019
- strain ASFV2020-015-B / 2020
- strain ASFV2020-018-B / 2020
- strain ASFV2020-008-B / 2020
- strain ASFV2020-013-B / 2020
- strain ASFV2020-019-B / 2020
- ◆ isolate PHL/RIZ/2019/5818-1 / Rizal / 2019
- strain BA26-0301 / Batangas / 2026
- strain BA26-0303 / Batangas / 2026
- strain BAN20221-4 / Bataan / 2022
- strain NEC20230929004B / Negros Occidental / 2023
- strain NEC20230929004A / Negros Occidental / 2023
- strain BA25-0104 / Bulacan / 2024
- strain MDR202311F / Oriental Mindoro / 2023
- strain NEC20230822001 / Negros Occidental / 2023
- strain NEC20230726003 / Negros Occidental / 2023
- strain BA25-0103 / Albay / 2024
- strain BA25-0107 / Batangas / 2024
- strain PHL-1969 / Central Luzon / 2019

0.0010

Observed changes in ASFV vaccine-like strains



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Gene	Function (Dixon et al. 2012)	Type of change relative to ASFV-G-ΔMGF-DMAC		
		strain BA25-0102 ★	strain BA25-1103 ★	strain BA26-0304 ★
A244L	Immune evasion	N/A	N/A	Frameshift mutation (truncated protein)
B263R	Unknown	N/A	N/A	Amino acid substitution
C257L	Unknown	Frameshift mutation (truncated protein)	N/A	N/A
C475L	Unknown	Frameshift mutation (truncated protein)	N/A	N/A
CP530R	Virus structure	Amino acid substitution	N/A	N/A
D205R (copy #2)	Replication	Amino acid substitution	N/A	N/A
EP402R	Immune evasion	Premature stop codon (truncated protein)	N/A	N/A
F317L	Unknown	Initiation codon mutation (deleted protein)	N/A	N/A
I215L	Other (regulation of host nuclear function)	N/A	Amino acid substitution	N/A
MGF 110-3L	Unknown	Amino acid substitution	N/A	N/A
MGF 110-7L	Unknown	N/A	Frameshift mutation (extended protein)	N/A
MGF 505-4R	Unknown	Amino acid substitution	N/A	Amino acid substitution
MGF 505-5R	Unknown	N/A	N/A	Amino acid substitution

Summary



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Generated baseline genomic information of ASFV

Vital for prevention and control strategies.
Sets the foundation for diagnostics
and vaccine research.



ASFV circulating strain is still clustered within Genotype II

No identified recombinants
Candidate vaccine/s strain is still relevant.
Major structural changes in field strains.
Available diagnostics should be effective



Virus tracking and Evolution

Tracked transmission patterns.
Determine diversification.
Identification of vaccine-like strains.

Call to Action



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Farmers and Veterinarians

- Adopt early reporting
- Participation in Surveillance
- Adopt Biosecurity and Science-driven practices

Scientists and Researchers

- Generate Genomic database
- Data sharing
- Innovate and create

Government

- Support research
- Encourage collaboration
- Craft sound and equitable policy
- Accurate reporting



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