

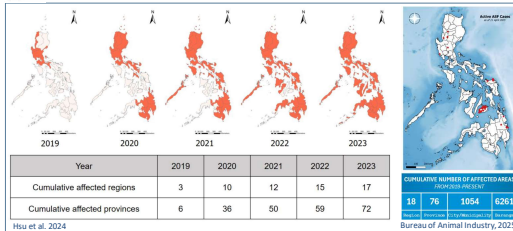
Rapid Response and Molecular Characterization of African Swine Fever Virus in the Philippines

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1 Introduction



Despite the technological advances, there are still unmet needs:

- Rapid onsite response to outbreaks
- Molecular characterization of pathogens
- Safe and effective vaccines

Summary/Key Points:

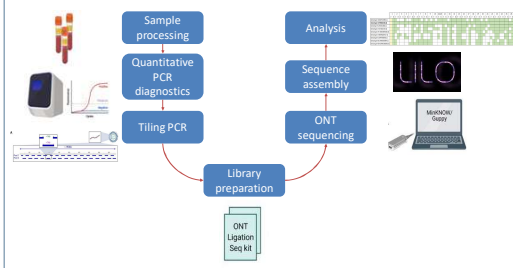
- To address unmet needs, a public-private collaboration of BioAssets and the Department of Science and Technology, the **Brisk Response through In-location Diagnostics and Genome Sequencing (BRIDGES) Project** was conceptualized to establish a comprehensive and unified approach to address the threat from infectious diseases.
- Here, we will highlight how we addressed the lack point-of-need response and molecular characterization of ASF virus in the Philippines since its implementation in 2021.

2 Methods/Approach

A. Mobile Biocontainment Laboratory for ASF Rapid Response



B. Molecular characterization of ASF virus



3 Results

A. Mobile Biocontainment Laboratory for ASF Rapid Response

The MBL's workflow has been optimized for ASF testing at the point-of-need. The MBL is also backed by a biorisk manual to ensure protocols for biosafety and biosecurity are maintained.



✓ BioAssets conceptualized the **Surveillance Against Veterinary Epidemics (SAVE)** through Rapid Response Mobile Biocontainment Laboratory.

✓ Through a consortium of state universities and colleges (SUC), the project aims to deploy an MBL to strategic SUC sites (locations are pinned in the map) to capacitate them to conduct research and surveillance of animal diseases.



B. Molecular characterization of ASF virus

A total of ten (10) whole genome sequences have been generated from a total of six (6) provinces from the Philippines. The table below presents the summary of WGS data generated from 2021-2023 ASF positive samples. NCBI accession numbers are provided to access the WGS data of each sample. [Montecillo et al. 2025](#)

Strain	Province	Cq value	Assembly length (bp)	%GC	Mean coverage	Predicted ORFs	NCBI Accession No.
ASFV Philippines/BAN20221-4/2022	Bataan	17.6	187,809	38.5	6,729x	183	PP332708
ASFV Philippines/BAN20221-5/2022	Pangasinan	17.9	188,514	38.4	5,181x	187	PP332709
ASFV Philippines/PTO20230501-1/2023	Rizal	30.2	188,540	38.4	4,985x	184	PP332710
ASFV Philippines/MOR202311/2023	Mindoro Oriental	19	188,514	38.4	5,576x	175	PP332711
ASFV Philippines/NEC20230728003/2023	Negros Occidental	19.2	188,517	38.4	5,092x	188	PP332712
ASFV Philippines/NEC20230822001/2023	Negros Occidental	18.7	188,528	38.4	2,673x	188	PP332713
ASFV Philippines/NEC20230929004/2023	Negros Occidental	19.9	188,539	38.4	2,905x	186	PP332714
ASFV Philippines/NEC20230929008/2023	Negros Occidental	20.3	188,539	38.4	3,283x	187	PP332715
ASFV Philippines/MOR202311/2023	Mindoro Oriental	19.1	188,501	38.4	1,022x	187	PP332716
ASFV Philippines/Pangasinan/04/2021	Pangasinan	21	192,265	38.3	21x	187	ON632862.2

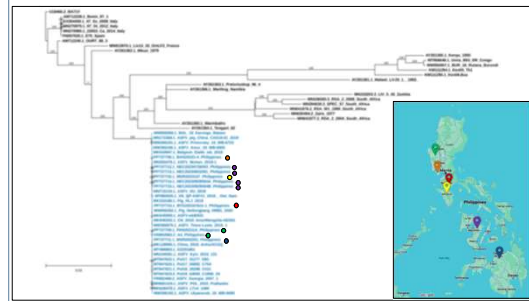


Figure above shows the maximum-likelihood consensus tree of select ASFV genomes (Asia and Europe) and the genomes of the Philippine strains, showing that ASF virus sequences generated from this project clustered together with p72 genotype II. The location of the source of samples are pinned on the map on the right, and samples are indicated with color-coded circles based on source of each sample. [Montecillo et al. 2025](#)

4 Discussion

- From 2019 to 2025, ASF has affected 76 out of 82 provinces in the Philippines.
- Comprehensive ASF surveillance and epidemiological investigation are the most important measures in outbreak prevention and control.
- The MBL's future implementation in state universities can support competency training of veterinary students and capacitate the universities in their research and surveillance.
- Whole genome sequences from the different provinces in the Philippines can be used to support evidence-based policy-making, as they provide information on possible trade activities among the provinces, virus genome clustering and on tracing spread of the ASF virus from one province to another.

5 Conclusion

- Through the BRIDGES project, BioAssets continues to strengthen the implementation and adoption of the MBL as a research and surveillance tool for the animal industry.
- Through BRIDGES project, BioAssets was also able to establish whole genome sequencing capacity for the ASF virus (and other animal diseases) in the Philippines.
- Overall, the BRIDGES project's efforts since its implementation in 2021 has supported the generation of meaningful information that can be used for diagnostics, vaccine research and policy making for early warning system. Such information will support the design of prevention and mitigation strategies that are key to enhancing the productivity in food animal production.



6

Main references:

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