



Mary Louise Penrith

Extraordinary Professor, University of Pretoria

African swine fever status and transmission routes in the African region



Regional training course (Africa)
Import risk analysis for African swine fever
9 November – 14 December 2021



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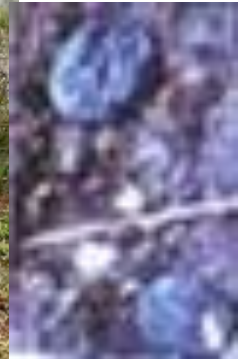
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Introduction



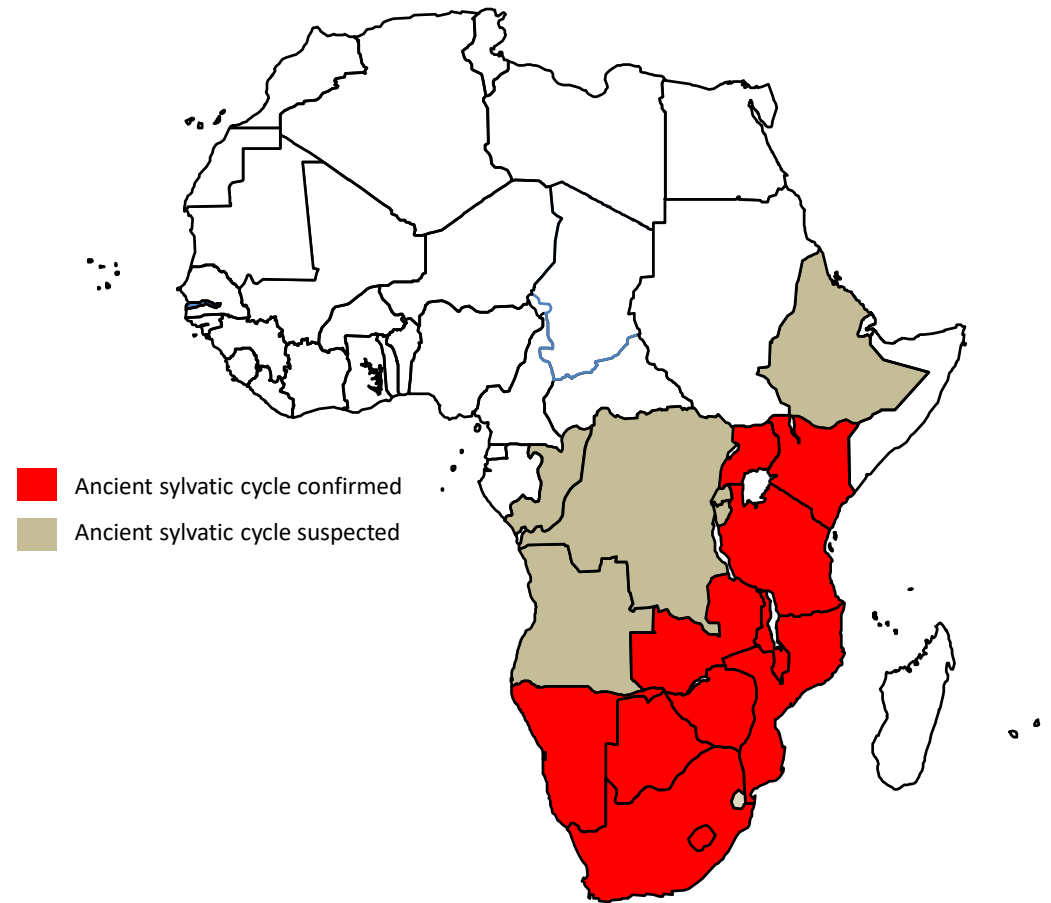
- African swine fever (ASF) evolved in eastern and southern Africa in an ancient sylvatic cycle between warthogs and argasid ticks of the *Ornithodoros moubata* complex that live in their burrows.
- This area has a long history of ASF outbreaks in domestic pigs and is home to all 24 known genotypes of ASF virus.
- First detailed account of the disease as it was observed in Kenya was published in 1921, followed by South Africa (1928) and Angola (1933).
- Limited to the sylvatic cycle area until late 1950s.



Sylvatic cycle of African swine fever

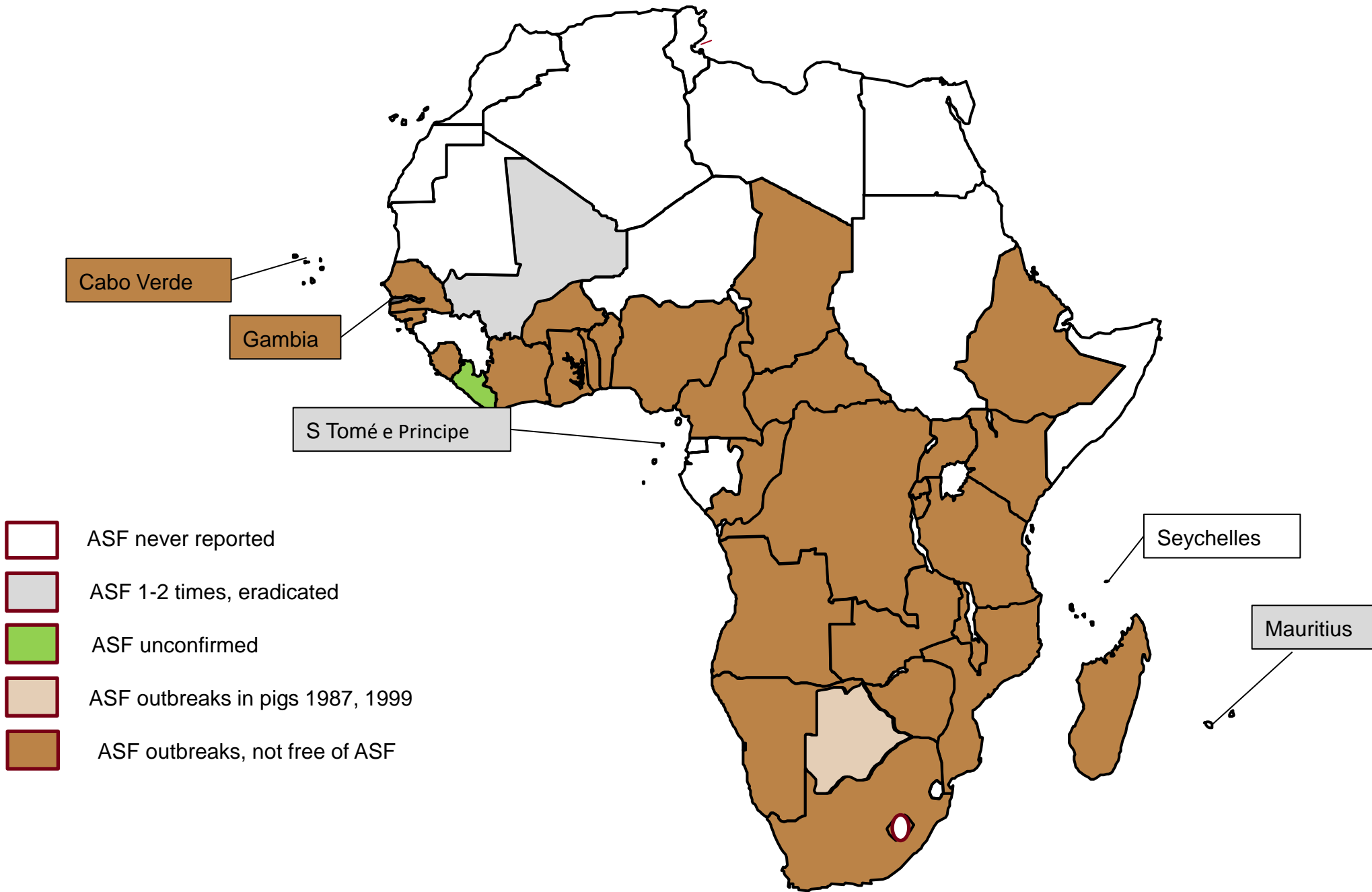


Distribution of the warthog-tick sylvatic cycle





- Currently 31 countries in Africa are infected with ASF, 14 of which are not in the area with the sylvatic cycle
 - Countries with the sylvatic cycle are considered permanently infected, with or without domestic pig outbreaks
 - Countries that have reported ASF in several years over the last decade and have not self-declared freedom are considered infected
- Liberia submitted one unconfirmed report to AU-IBAR in 2011 and is considered of uncertain status
- Three countries (Mali, Mauritius, São Tomé e Príncipe) have suffered single incursions that were rapidly eradicated.



Transmission cycles of African swine fever in Africa



Warthog-tick sylvatic cycle

Domestic pig cycle

Domestic pig-tick cycle



Transmission cycles involving soft ticks of the *Ornithodoros moubata* complex

- *Ornithodoros moubata* complex ticks are biological vectors of African swine fever; virus replicates in the ticks and they can remain infected and infective to hosts for at least five years
- Warthog-tick sylvatic cycle (classic sylvatic cycle)
 - Warthogs do not develop clinical signs of ASF
 - Cycle between baby warthogs and *Ornithodoros moubata* complex soft ticks (eyeless tampan) that live in their burrows and transmit the virus while feeding on warthogs
 - Baby warthogs develop high enough viraemia to infect ticks feeding on them
 - Older warthogs do not develop high enough viraemia and transmission from warthogs to domestic pigs is via the bites of the ticks
 - The ticks spend most of their time in the burrows, feeding at night, but sometimes the nymphs (immature ticks) travel in numbers on warthogs and may get into contact with domestic pigs
- Bushpigs also do not develop clinical signs of ASF but are not associated with ticks and a role for them in transmission of ASF virus to domestic pigs has not been established



Transmission cycles involving soft ticks of the *Ornithodoros moubata* complex

- Domestic pig-tick cycle
 - There are members of the *Ornithodoros moubata* complex that have pigs (and humans) as their preferred host and inhabit pig shelters that offer hiding places for them in cracks and crevices and under earth floors
 - A cycle of maintenance of ASF between an *Ornithodoros* tick was first discovered in Spain in 1962 after an introduction of ASF in 1960
 - In Africa, a cycle of ASF involving domestic pigs and *Ornithodoros moubata* complex ticks was confirmed in an endemic area in Malawi in the 1980s
 - There were no warthogs in the area and bushpigs that were sampled for ASF virus were negative
 - High numbers of domestic pigs tested positive for antibodies to ASF so had clearly survived infection
 - This cycle is possibly more widespread in Africa but has not been investigated extensively
 - The importance of this cycle is that it enables persistence of ASF virus for long periods even in the absence of pigs



Transmission cycle in domestic pigs

- By far the most widespread cycle of transmission of ASF occurs in domestic pigs in the absence of either natural wild hosts or vectors
- Transmission of the virus involves live infected pigs, infected pork, and fomites (objects contaminated with the virus) and is driven by human activities
 - Pigs infected with ASF virus shed large amounts of the virus in all secretions and excretions so are efficient transmitters of the virus
 - ASF virus can persist for long periods in chilled and frozen pork and will infect pigs that are fed on raw or undercooked pork or pork products
 - ASF virus can persist in organic material for varying periods of time so contaminated objects including footwear pose a risk of transmission of ASF
- Prevention can be achieved by the implementation of basic biosecurity measures on pig farms and throughout pig and pork value chains



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