

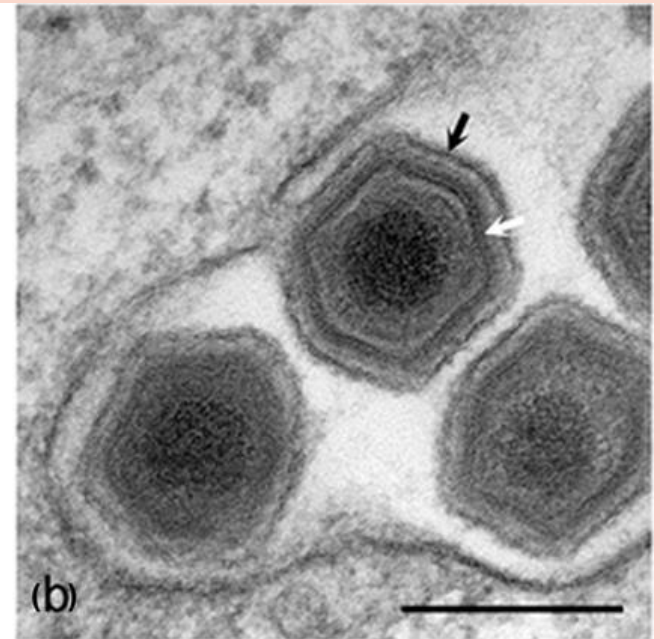
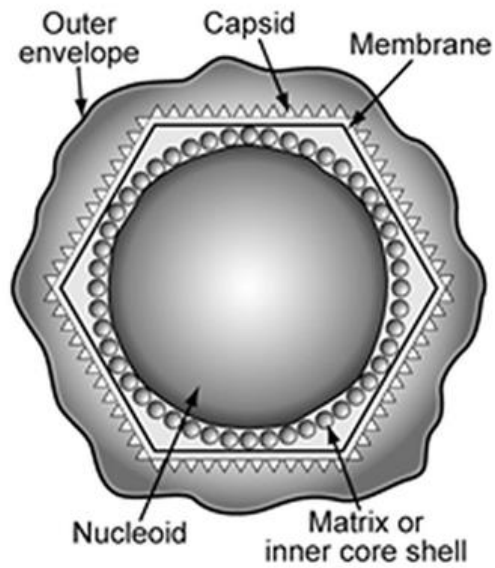
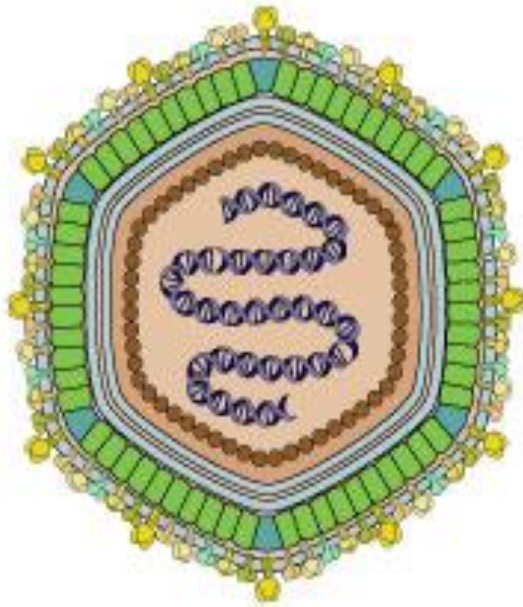
Asfarviridae



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Structure of African swine fever virus



(Image source-Google)

Characteristics

- (Asfar = African swine fever and related viruses)
- Family *Asfarviridae* contains single genus *Asfivirus*
- African swine fever virus (ASFV) is the type species
- Large, enveloped, ds DNA virus with complex icosahedral symmetry
- African swine fever virus- only known DNA arbovirus

Characteristics

- Replication also occurs in soft ticks of genus *Ornithodoros* (biological vector)
- Stable over a wide range of temperature (4°C to 20°C) and pH (several hours at pH 4 or pH 13).
- Virus may persist for months and even years in refrigerated meat.
- Virus is thermolabile and sensitive to lipid solvents.

Virus Replication

- Occurs primarily in cytoplasm, nucleus needed for viral DNA synthesis
- DNA transcribed by a virion-associated, DNA-dependent RNA polymerase
- Viral DNA is present in the nucleus soon after infection
- Designation “nucleocytoplasmic” - used for replication.
- Virus enters susceptible cells by receptor-mediated endocytosis.
- Virus release- by budding/ cellular disintegration.

African swine fever

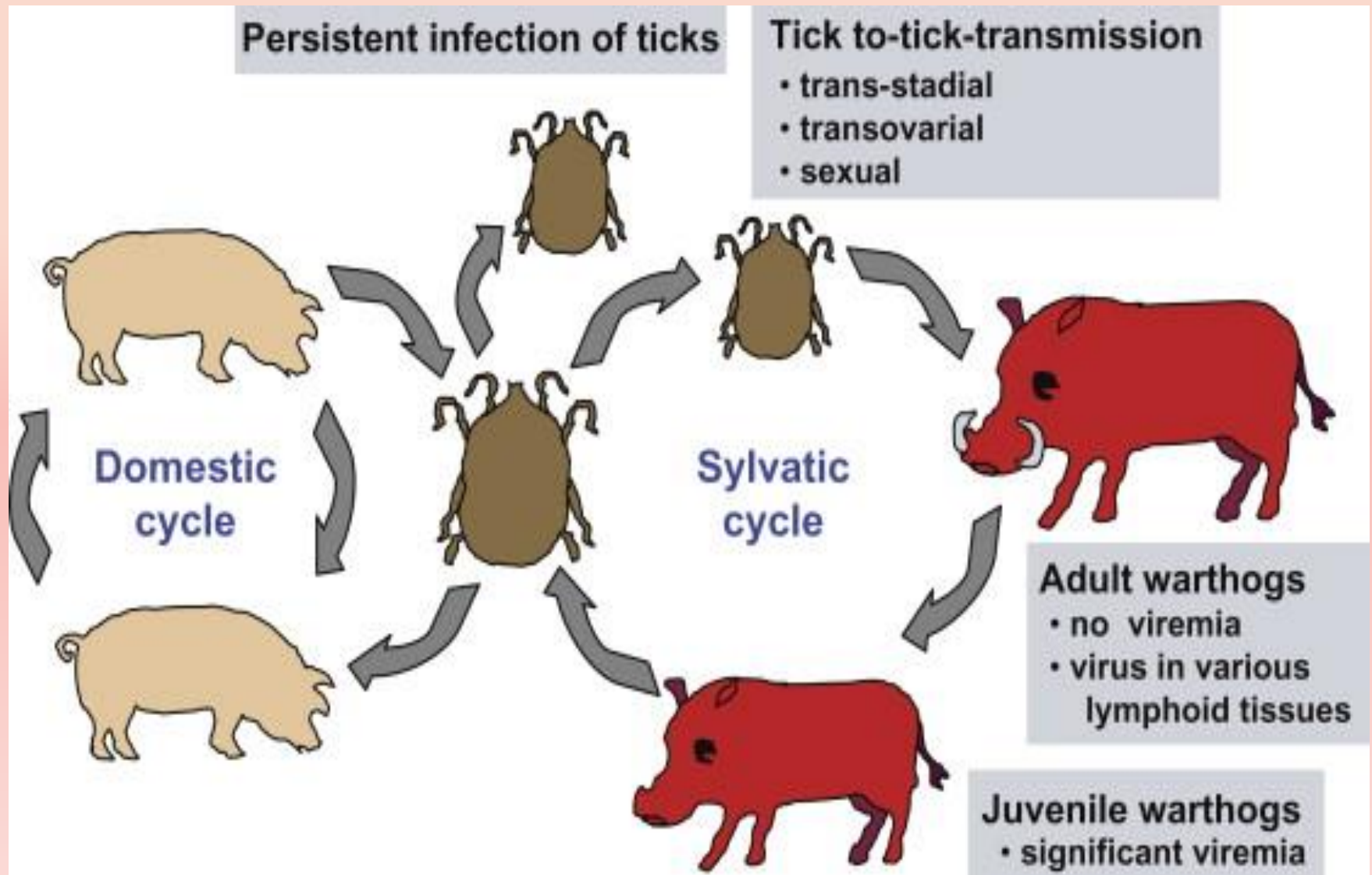
- No report of disease in India
- Infects domestic swine and other members of family *Suidae* (warthogs, bushpigs and wild boar).
- Two distinct patterns of transmission occur:
 - sylvatic cycle in warthogs and ticks in Africa
 - epizootic and enzootic cycles in domestic swine
- Sylvatic cycle involves soft ticks of genus *Ornithodoros* and inapparent infection of warthogs and bushpigs

Sylvatic cycle

- **young warthogs** develop viraemia and are a major source of virus for soft ticks.
- Ticks are biological vectors of the virus.
- Both transovarial and trans-stadial transmission occurs.
- virus also transmitted between developmental stages of tick (trans-stadial transmission).

- Virus excreted in tick saliva, coxal fluid and Malpighian excrement.
- Infected ticks may live for several years.
- Can survive for long periods of time without taking a blood meal.
- Capable of transmitting the virus to swine at each blood meal.
- Older warthogs are persistently infected, but are seldom viremic.

Patterns of transmission of African swine fever virus



(Fig. source: Google)

Domestic Cycle

❑ Pigs get infected:

- By the bite of infected ticks
- Or, through consumption of tissues from acutely infected domestic pigs or warthogs

❑ High titers of virus present in nasopharyngeal excretions during onset of clinical signs

❑ Virus also present in other excretions (feces, urine etc.) in during acute disease.

Mode of spread

- Ingestion of uncooked meat from infected warthogs or domestic pigs
- direct contact usually through oral or nasal secretions.
- by contact with blood shed as a result of fighting.

Indirect transmission

- through contaminated transport vehicles, fomites, footwear
 - body fluids and tissues contain large quantities of virus until death or recovery occurs.

Pathogenesis and pathology

- virus replicates initially in pharyngeal mucosa, tonsils and regional lymph nodes.
- spreads by bloodstream to other LN, bone marrow, spleen, lung, liver and kidneys.
- Secondary replication in these sites results in prolonged viraemia.
- virus replicates primarily in cells of lymphoreticular system
- also infect megakaryocytes, endothelial cells, renal epithelial cells and hepatocytes.

- Infection of domestic swine results in leukopenia, lymphopenia, thrombocytopenia.
- Apoptosis of lymphocytes and mononuclear phagocytic cells.
- swine may become persistently infected without ever showing clinical signs.
- Disease range from inapparent, peracute to chronic infection.
- Symptoms relate to challenge dose, virulence of virus and route of infection.

Clinical signs

Peracute disease

-die suddenly without premonitory clinical signs.

Acute disease

- Fever, inappetence, depression and recumbency
- cutaneous hyperaemia, in some cases haemorrhages
- dyspnoea, conjunctivitis, diarrhoea, bleeding from the nose and rectum and abortion
- high mortality rate
- Sometimes cyanotic areas on ears, limbs and extremities

Lesions

- splenic enlargement
- swollen haemorrhagic gastrohepatic and renal lymph nodes
- Subcapsular petechiation in the kidneys
- petechial and ecchymotic haemorrhages on serosal surfaces
- oedema of the lungs and hydrothorax

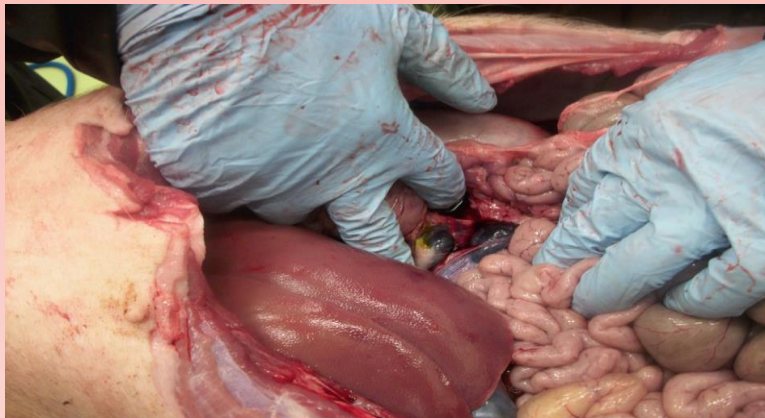
Chronic disease

- cutaneous ulcers, pneumonia, pericarditis, pleuritis, arthritis and inappetence

Clinical and pathological signs of ASF



Subcutaneous hemorrhages of ears and body



Enlargement and haemorrhage of the gastrohepatic lymph node and spleen

(Image source: Google)

Diagnosis

- Suitable samples- blood, serum, tonsil, spleen and lymph nodes.
- Virus isolation in swine bone marrow or peripheral blood leukocyte cultures
- Immunofluorescence staining of tissue smears or frozen sections.
- ELISA, immunoblotting, CFT
- Polymerase chain reaction (PCR)

Prevention and control

- Restriction of pig movement
- serological monitoring of carrier pigs
- prevention of contact between domestic pigs and warthogs or ticks
- Slaughter of infected pig
- Proper cooking of garbage before feeding
- Eradication of tick species which act as vectors of ASFV