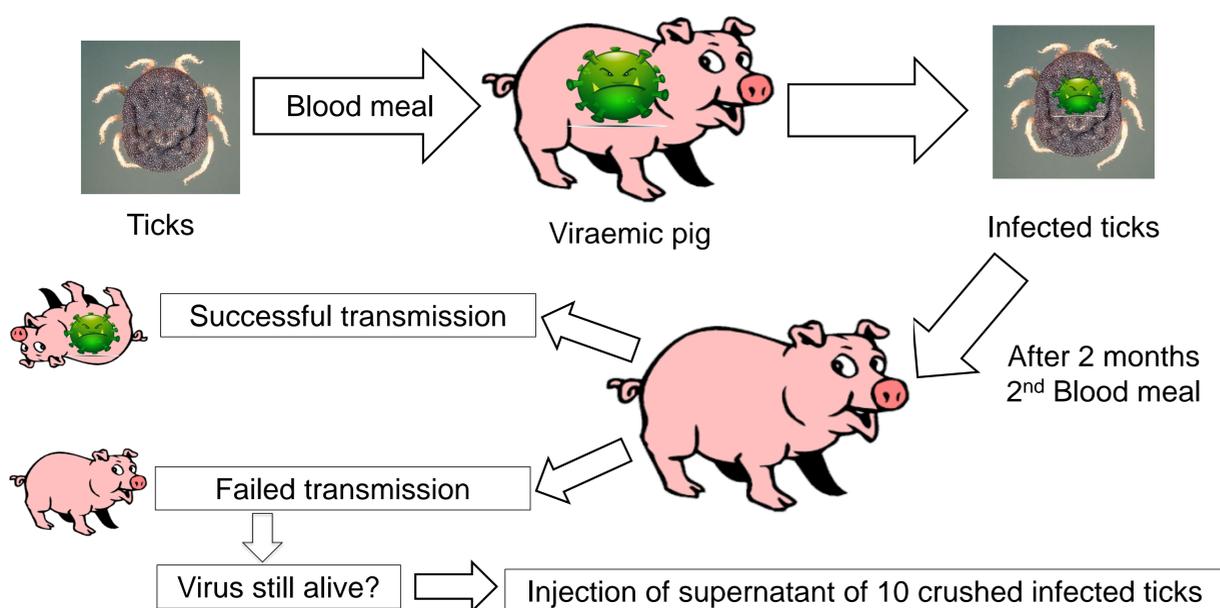


Background

African swine fever (ASF) has spread to Eastern Europe. A known route of ASF virus (ASFV) transmission to pigs is through the bite of infected soft ticks. Some species in the *Ornithodoros* genus are competent vectors and long-term ASFV reservoirs. In Europe, the role of autochthonous soft ticks in ASFV transmission and maintenance remains to be determined.

The aim of this study was to determine the ability of 2 soft ticks species, respectively from the Iberian Peninsula (*O. erraticus*) and Ukraine (*O. verrucosus*), to transmit 3 highly virulent ASFV strains from Europe (Georgia 2007/1, Zapo, and Our T 88/1) in comparison to the African confirmed tick vector *O. moubata* for the Liv13/33 strain.

Materials and methods



Pigs were inoculated intra-muscularly with 10^4 HAD/pig of one ASFV strain. Ticks were then infected by feeding on viraemic pigs. After 2 months, these ticks were fed on healthy pigs for testing the viral transmission. We tested five tick-ASFV pairs:

- *O. moubata*-Liv13/33 (OmL)
- *O. erraticus*-Our T 88/1 (OeO),
- *O. moubata*-Georgia 2007/1 (OmG),
- *O. erraticus*-Georgia 2007/1 (OeG)
- *O. verrucosus*-Zapo (OvZ).

For transmission, we tested a single challenge with 30 ticks per pig for all pairs and a triple challenge with 15 ticks per pigs and per challenge for OeG and OmG.

When the transmission failed, 10 ticks/pair were crushed and the supernatant of tick homogenate was injected to a naïve pig.

Results

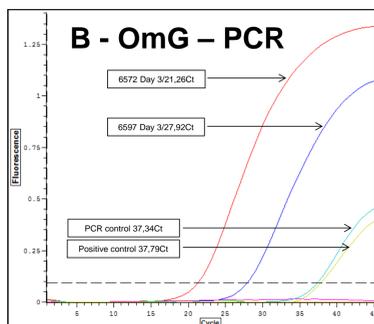
A - Successful transmission

Pig	Tick-virus	Condition	First day hyperthermia	Day of euthanasia
6573	OmL	Single challenge	2 dpc	3 dpc
6594	OmL	Single challenge	2 dpc	3 dpc
6604	Contact	Control	/	3 dpc
6572	OmG	Single challenge	3 dpc	4 dpc
6575	Contact	Control	/	4 dpc
6597	OmG	Single challenge	4 dpc	4 dpc

O. moubata was able to transmit two different strains : Liv13/33 from genotype I, and Georgia2007/1 from genotype II.

Both pairs OmL and OmG transmitted ASFV to healthy pigs with single challenge (A). The pair OmL transmitted faster than OmG. Furthermore, for OmG, one pig (6597) was viraemic at day 3 post challenge but not in hyperthermia, probably due to a lower viremia than the other pig (6572) (B).

However, the tick-virus pair OmG was not able to transmit the ASFV in the triple challenge.



O. erraticus and *O. verrucosus* did not transmit ASFV.

For failed transmission pairs (C), all inoculated pigs with ticks homogenates developed clinical signs and viremia within a week.

C - Failed transmission – Injection of crushed ticks

Pig	Tick-virus	First day hyperthermia	Day of euthanasia
6600	OeG	4 dpi	6 dpi
6606	OeO	3 dpi	5 dpi
6567	OvZ	5 dpi	6 dpi

Conclusion

We verified that the known African vector *O. moubata* is able to transmit 2 different ASFV strains from genotypes I and II, including Georgia2007/1 currently circulating in Europe. In our experimental conditions, *O. erraticus* and *O. verrucosus* did not transmit ASFV to healthy pigs through biting although the inoculation of tick homogenates to pigs resulted in clinical signs. One hypothesis is the “dose effect” and a second transmission trial is planned with more *O. erraticus* ticks than tested here. Indeed, results for OmG also suggest a “dose effect” as the first challenge with 15 ticks of the triple challenge experiment did not cause the pathology while the single challenge with 30 ticks induced ASF.