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African swine fever threats: are we ready?

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African swine fever (ASF) is one of the most complex and lethal disease of swine. The disease transmission involves domestic pigs, wildboars, warthogs and bushpigs. ASFV usually induces unapparent infection in a variety African wildboar population. Soft ticks (Ornithodoros spp) act as reservoir and biological transmission vectors.

ASF is endemic in the majority of sub-Saharan Africa. Within EU, it is confined to Sardinia. On June 2007, ASF was notified in the Caucasus region, in Georgia. It was associated to a new isolate, related to p72 *genotype II*, circulating in East Africa. Since then, ASF progressed to neighbouring countries Armenia, Azerbaijan and Russian Federation, reaching the near border with Ukraine, and, on October 2009, jumping to St Petersburg in north-western Russia, in the Baltic Sea. Current situation of ASF threatens the EU countries, Eastern Europe, the Black Sea basin countries and - in the worst case scenario – central Asia and even China, which has the largest pig population in the world.

There is no vaccine available and control strategies are based on rapid laboratory diagnosis. But, are we ready to combat with ASF? Would current diagnostic techniques be sensitive enough taking into consideration the new circulating viruses?

From 2000 to date, reliable, specific, and fast PCR tools have been developed and validated for virus detection. They have been shown to be highly sensitive for the detection of the new current circulating isolates in Europe and Africa.

However, serological surveillance studies performed in East Africa among 2004-2009, have shown low seroprevalence with, in contrast, a high incidence of virus in domestic pigs. This could be related to genome variability of antigenic ASF proteins in Eastern African isolates, the more variable and genotypically distant. To what extent current serological diagnostic techniques might be missing some of these new variants?

To study these questions, different ASFV were selected on the basis of genome variability criteria and date collection. Particular emphasis was placed to those belonging to *p72 genotype X*, the most variable, and *p72 genotype II*, current European circulating genotype. After successfully adapted to grow in COS cells, new soluble cytoplasmic antigens were used in indirect ELISA tests for initial standardization. To evaluate the capability and competence of these new tests with regards to the formal ASF serological tests, a comparative study is carrying out using a wide panel of serum comprising: i) experimental sera from "*in vivo*" experiments with East Africa and Caucasus ASFV circulating isolates ii) field sera from East-West Africa and Sardinia from 2004 to 2009. The preliminary results using the new *p72 genotype* X-based antigen indicate correlation to those using OIE serological tests and INGEZIM PPA.K3 Compac®. It's important to highlight the results achieved analysing negative serum samples from "apparently healthy" virus-positive pigs from East Africa. The capability of new others ASFV antigens from Africa and Caucasus to be used in ASF serological tests is under evaluation.

Theses results together with those obtained from *in vivo* experiments at CISA-INIA with recent isolates from East Africa and Caucasus regions, could be the first approach demonstrating the capability of the formal diagnostic techniques to perform a serological diagnosis with high sensitivity, specificity and confidence, adapted to current epidemiological situations.

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