



Review

Virological diagnosis of African swine fever—Comparative study of available tests

C.A.L. Oura^{b,*}, L. Edwards^a, C.A. Batten^a^a Institute for Animal Health, Pirbright, Woking, Surrey GU24 0NF, UK^b School of Veterinary Medicine, University of the West Indies, St Augustine, Trinidad and Tobago

ARTICLE INFO

Article history:

Received 9 August 2012

Received in revised form 12 October 2012

Accepted 19 October 2012

Available online 3 November 2012

Keywords:

Virological diagnosis
African swine fever

ABSTRACT

The rapid and reliable detection of African swine fever virus (ASFV) is essential both for timely implementation of control measures to prevent the spread of disease, and to differentiate African swine fever (ASF) from other pig disease with similar clinical presentations. Many virological tests are currently available for the detection of ASFV (live virus), antigen and genome, including virus isolation, ELISA, fluorescent antibody, polymerase chain reaction (PCR) and isothermal assays. In recent years real-time PCR (rPCR) has become one of the most widely used formats for virological diagnosis providing sensitive, specific and swift detection and quantification of ASFV DNA. The ability to integrate rPCR into automated platforms increases sample throughput and decreases the potential for cross-contamination. In more recent years isothermal assays, which are a lower-cost alternative to PCR more suitable for use in non-specialised or mobile laboratories, have been developed for the detection of ASFV, however these assays have not been fully validated for routine use in the field. The performance of all virological detection assays in ASF diagnostics, as well as prospects for improving diagnostic strategies in the future, are discussed and reviewed in this chapter.

© 2012 Elsevier B.V. All rights reserved.

Contents

1. Introduction	150
2. Diagnostic samples for ASFV detection	151
3. Virological diagnosis of ASFV	151
3.1. Virus isolation	152
3.2. Antigen-based assays	152
3.2.1. The fluorescent antibody test (FAT)	152
3.2.2. Antigen ELISA	152
3.3. Molecular assays for ASFV detection	152
3.3.1. PCR (conventional)	153
3.3.2. PCR (real-time)	153
3.3.3. PCR assays (multiplex)	154
3.3.4. Isothermal amplification assays	154
4. Comparison of rPCR, LAMP and antigen ELISA for detection of ASFV in experimental and field tissues	155
5. Detection of ASFV in <i>Ornithodoros</i> ticks	156
6. Concluding remarks and prospects for the future	156
Acknowledgements	157
References	157

* Corresponding author at: School of Veterinary Medicine, Faculty of Medical Sciences, University of the West Indies, Eric Williams Medical Sciences Complex, Uriah Butler Highway, Champ Fleurs, Trinidad. Tel.: +868 645 3232x4220, +868 725 4263; fax: +868 645 7428.

E-mail addresses: chris.oura@sta.uwi.edu (C.A.L. Oura), lorraine.edwards@iah.ac.uk (L. Edwards), carrie.batten@iah.ac.uk (C.A. Batten).

1. Introduction

Diagnosis of African swine fever (ASF) is the identification of animals that are or have previously been infected with African swine fever virus (ASFV). A positive diagnosis involves the detection and identification of ASFV-specific antigens, antibodies or DNA in