



**HAL**  
open science

## QUANTITIVE DETECTION OF AVIPOXVIRUS DNA IN HOUBARA BUSTARD LESIONS BY REAL-TIME PCR

Guillaume Le Loc'H, Guillaume Croville, Florian Grard, Christelle  
Camus-Bouclainville, Stéphane Bertagnoli

### ► To cite this version:

Guillaume Le Loc'H, Guillaume Croville, Florian Grard, Christelle Camus-Bouclainville, Stéphane Bertagnoli.  
QUANTITIVE DETECTION OF AVIPOXVIRUS DNA IN HOUBARA BUSTARD LESIONS BY REAL-TIME PCR.  
IX International congress for veterinary virology, Sep 2012, Madrid, Spain. 2012. <hal-02809419>

**HAL Id: hal-02809419**

**<https://hal.inrae.fr/hal-02809419v1>**

Submitted on 6 Jun 2020

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.



HAL Authorization

# QUANTITIVE DETECTION OF AVIPOXVIRUS DNA IN HOUBARA BUSTARD LESIONS BY REAL-TIME PCR

Guillaume Le Loc'h<sup>1,2,3</sup>, Guillaume Croville<sup>1,2</sup>, Florian Grard<sup>1,2</sup>, Christelle Camus-Bouclainville<sup>1,2</sup>, Stéphane Bertagnoli<sup>1,2</sup>

- (1) INRA, UMR 1225, F-31076 Toulouse, France
- (2) Université de Toulouse, INP-ENVT, F-31076 Toulouse, France
- (3) Emirates Center for Wildlife Propagation, Missour, Morocco

## Objectives

*Avipoxvirus sp.* is a serious threat for the success of reinforcement programs of some endangered birds species. In the endangered Houbara bustard (*Chlamydotis sp.*), avipoxvirus infections can lead to high morbidity in captivity and compromise the survival of wild release birds. However, up to now, avipoxvirus infections in houbara bustards were poorly studied. In order to better understand its epidemiology and pathogenesis, a quantitative detection method of viral DNA using SYBR-green real-time PCR was developed as a tool for further studies. Quantitative detection using this method was successfully applied in houbara bustard lesions.

## Methods

From a houbara bustard lesion, the avipoxvirus 4b core protein gene was amplified and sequenced. Primers were designed from this sequence. After cloning, scalar dilutions of the plasmid constructed were made and concentration and purity were determined through spectrophotometric analysis at 260/280 nm. Dilutions were then used for a SYBR-green real-time PCR assay to validate the method and determine its sensitivity. Finally, DNA extracted from houbara bustard lesions was used for a SYBR-green real-time PCR assay to test the method on biological samples.

## Results

Primers were designed from the houbara bustard sequence to have 100% identity with published houbara bustard sequence of 4b core protein gene and with the complete genome of canarypox virus. The theoretical size of the amplicon is 109bp. The chosen primers were very effective in most of plasmid dilutions and the assay encompassed at least six orders of magnitudes (from  $10^7$  to  $10^2$  copies) with a high linear relationship ( $r^2 > 0.99$ ) between CT values and plasmid copies. Quantitative detection in houbara bustards lesions with the assay allowed viral DNA detection in clinically diagnosed lesions.

## Conclusion

The method developed here showed its efficiency for detection and quantification of avipoxvirus DNA in biological samples. We expect that this method will be a valuable tool either for epidemiological studies like viral detection in potential insect vectors or for in-vivo and in-vitro infection studies.

## Description

A SYBR-green real time-PCR assay was developed for quantitative detection of avipoxvirus DNA. The method was successfully applied for detection and quantification of viral DNA in houbara bustard lesions.

## Keywords

Avipoxvirus; 4b core protein gene; SYBR-green real time-PCR; Houbara bustard; *Chlamydotis sp.*

## Acknowledgements

We are grateful to H.H. Sheikh Mohamed bin Zayed Al Nahyan, Crown Prince of Abu Dhabi and Chairman of the International Fund for Houbara Conservation (IFHC) and H.E. Mohammed Al Bowardi Deputy Chairman of IFHC for their support.