



**HAL**  
open science

## Variability of fungi detection in the respiratory tract of racehorses according to the sampling site

Louise C Lemonnier, Anne Couroucé, Margot Cessans, Ludovic Petit, Jacqueline Martina Cardwell, Marie-Pierre Toquet, Eric Richard

### ► To cite this version:

Louise C Lemonnier, Anne Couroucé, Margot Cessans, Ludovic Petit, Jacqueline Martina Cardwell, et al.. Variability of fungi detection in the respiratory tract of racehorses according to the sampling site. 11th International Conference on Equine Exercise Physiology (ICEEP11), Jun 2022, Uppsala, Sweden. , 18 (Supp 1). hal-03727163

**HAL Id: hal-03727163**

**<https://hal.science/hal-03727163>**

Submitted on 19 Jul 2022

**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.

## Variability of fungi detection in the respiratory tract of racehorses according to the sampling site

Louise C. LEMONNIER<sup>1</sup>, A. COUROUCE<sup>1,2</sup>, M. CESSANS<sup>1</sup>, L. PETIT<sup>3</sup>, J.M. CARDWELL<sup>4</sup>, M-P. TOQUET<sup>3</sup>, E.A. RICHARD<sup>2,3</sup>

<sup>1</sup>Department of Equine Internal Medicine, University Animal Hospital, CISCO-Oniris, Route de Gachet, 44300 Nantes, France

<sup>2</sup>BIOTARGEN, Normandie Univ, UNICAEN, 14000 Caen, France

<sup>3</sup>Labeo-Frank Duncombe Laboratory, 1 route de Rosel, 14053 Caen, France

<sup>4</sup>Department of Pathobiology and Population Sciences, Royal Veterinary College, Hatfield, Hertfordshire, UK

### INTRODUCTION

- The clinical relevance of colonization of equine airways by fungi is unclear.
- Diagnosis of fungi in the respiratory tract is fastidious and there is no method of reference.

### OBJECTIVES

- To characterize fungi from upper and lower airways of racehorses
- To determine the most reliable methodology for fungal detection

### HYPOTHESIS

- Fungal cytology of a pooled BAL (BAL<sub>P</sub>) is representative of corresponding left (BAL<sub>L</sub>) and right (BAL<sub>R</sub>) samples.

### METHODS

- 30 Standardbred racehorses in active training, aged 4.6 ± 1.6 years, from 3 different training stables
- TW, followed by BAL from each lung separately, collected through a guarded catheter and gastroscope

- Fungi detection, identification and characterization by cytology and culture
  - Positive culture: ≥ 1 mold identified
  - Positive cytology: ≥ 1 fungal element (hyphae, spore) observed

### RESULTS

- Fungal culture (Table 1)
  - TW: 28/30 (93%) positive
  - BAL<sub>P</sub>: 4/30 (13%) positive → All positive in TW, 3/4 with same fungi
  - 9 genus (alone or concomitant) : *Aspergillus* (5 genus) 13/28 (46%), *Penicillium* 12/28 (43%)

Table 1: Identification of fungi in horses with a positive BAL<sub>P</sub> culture

Case number	9		17		18		21	
	TW	BAL <sub>P</sub>	TW	BAL <sub>P</sub>	TW	BAL <sub>P</sub>	TW	BAL <sub>P</sub>
<i>A. fumigatus</i>								x
<i>A. nidulans</i>	x		x	x	x			
<i>A. versicolor</i>								x
<i>Penicillium</i>	x		x		x	x	x	x
<i>Aureobasidium</i>		x						
<i>Chrysosporum</i>	x							

Table 2: Cytology of pooled and individual BALF, and of TW

	Cytology positive	Spores	Hyphae	Phagocyted
TW	22/30	18/22	16/22	14/22
BAL <sub>P</sub>	7/30 3 bilateral 4 unilateral	7/7	2/7	6/7
BAL <sub>R</sub>	8/30	5/8	6/8	5/8
BAL <sub>L</sub>	7/30	7/7	0/7	6/7

### Comparison of sample sites (Table 3)

- Poor agreement between BAL<sub>L</sub> and BAL<sub>R</sub>
- Poor agreement between culture and cytology
- BAL<sub>P</sub> vs separate lungs:
  - Not equivalent (p = 0.025 by McNemar Test)
  - Sensitivity = 0,58 ; Specificity = 1,00

### Fungal cytology (Table 2)

- TW: 22/30 (73%) positive ; 12/22 (55%) with both spores and hyphae, frequently phagocyted
- BAL: Large disparity between lungs

Table 3: Comparison of BALF sample sites, and of BALF methods of analysis

	BAL <sub>L</sub> only	BAL <sub>R</sub> only	BAL <sub>L+R</sub>	Agreement (κ)
Cytology	4/7	5/8	3	0,015
	Culture only	Cytology only	Culture + cytology	Agreement (κ)
BAL <sub>P</sub>	3/4	6/7	1/7	0,015

### DISCUSSION

- Despite a similar prevalence of fungi detection in left and right BAL, a large disparity was found between lungs on cytology.
- Detecting fungi by cytology on either BAL<sub>P</sub> or BAL<sub>L</sub> + BAL<sub>R</sub> was not equivalent

### CONCLUSION

Pooled BAL is a highly specific while fairly sensitive alternative to combined cytology of individual left/right samples for mold/fungi detection.