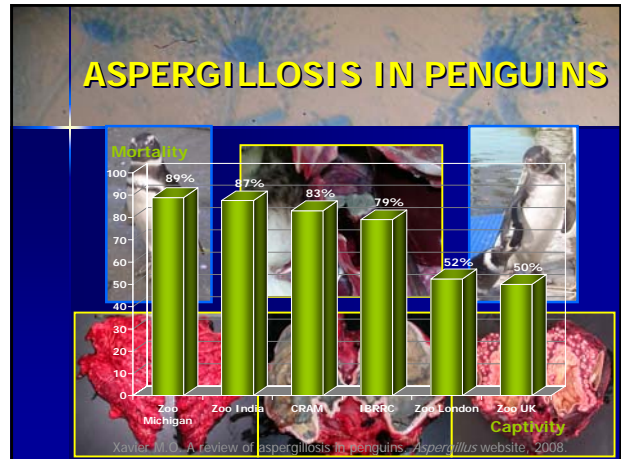


Effects of Oil on Wildlife  
10th International Conference


**Galactomannan analysis and immunodiffusion technique in the diagnosis of aspergillosis in penguins**

Melissa Orzechowski Xavier, Ruoppolo V, Adornes AC, Leite AM, Silva Filho RP, Meireles MCA, Severo LC.



### ASPERGILLOSIS IN PENGUINS

#### Predisposition



- ✗ Anatomic and Physiologic
- ✗ Immune system
- ✗ Handling
- ✗ Oil
- ✗ Drugs

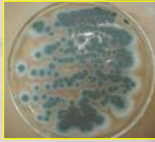




Redig PT, *Zoo and Wild Animal Medicine* 178-181, 1993;  
Tell LA, *Med. Mycol.* 43:71-73, 2005.

### ASPERGILLOSIS IN PENGUINS

- ✗ Difficulty in early diagnostic
  - Nonspecific clinical signs
  - RX: late alterations
  - Limitations
    - ✗ Mycology
      - Low sensitivity
    - ✗ Histopathology
      - Sample collection

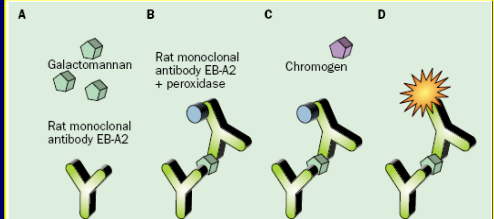
Antibody detection

Redig PT, *Zoo and Wild Animal Medicine* 178-181, 1993;  
Grazick et al., *Mycopathologia* 140:121-127, 1998; German et al., *Vet. Rec.* 150:513-518, 2002.

### New diagnostic test

- ✗ Antigen detection
  - Galactomannan (Platelia® *Aspergillus* EIA)



Mennink-kersten et al., *Lancet Infect. Dis.* 4:349-357, 2004;  
Wheat LJ, *Clin. Microbiol. News* 27:51-57, 2005.

### Platelia® *Aspergillus* EIA

- ✗ Commercial Kit - BioRad
  - Human neutropenic hosts
    - Serum samples
  - High sensitivity and specificity
  - Few studies in animal hosts

Garcia et al., *J Med Vet B* 48:743-50, 2001; Wheat LJ, *Clin Microbiol News* 27:51-7, 2005;  
Arca-Ruibal et al., *Vet Rec* 158:442-4, 2006; Cray et al., *J Zoo Wild Med* 40: 64-70, 2009.

## Objective

- ✘ Evaluate the performance of antibody detection by the immunodiffusion test (ID) and the galactomannan detection by Platelia *Aspergillus* for the diagnosis of aspergillosis in penguins from a rehabilitation centre

## Material and Methods

35 serum

- 9 aspergillosis
- 3 malaria
- 2 cachexia
- 21 healthy

### Immunodiffusion

AMMO USA

## Material and Methods

30 serum

- 5 aspergillosis
- 3 malaria
- 2 cachexia
- 20 healthy

### ELISA


## Aspergillosis Gold standard

## Material e Methods Statistical analyses

		Aspergillosis	Non aspergillosis	
Diagnostic test	+	a (true positives)	b (false positives)	Se Sp PPV NPV
	-	c (false negatives)	d (true negatives)	

## RESULTS

- ✘ Immunodiffusion test (n=35)
  - Positives: 3/9 aspergillosis; 1/21 healthy



## Results

\* Platelia *Aspergillus* EIA: cut-off 0.5

Underling disease	n	DO variation	Mean DO
Aspergillosis	5	1.76 to >12.5	6.54
Malaria	3	1.46 to 3.59	2.52
Cachexia	2	2.31 to 3.88	3.09
None	20	3.71 to >11.9	7.07




## Results and Discussion

\* Performance ID / Platelia EIA

Test	Se	Sp	PPV	NPV
ID	33%	96%	75%	81%
EIA	100%	0%	17%	0

Reigz198, Ruckelshausen et al., 2007, 2008, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025. Fibrin clots ??

60% of healthy (free-living) penguins had anti-Aspergillus



## CONCLUSION

\* Galactomannan testing of sera performed disappointingly in the diagnosis of invasive aspergillosis in penguins. An unacceptably high rate of false-positive results occurred. ID testing seems to still hold its place in the diagnosis of this condition, despite showing a very low sensitivity. New diagnostic modalities deserve investigation in the field.



## Acknowledgments



## Thank you!

melissaxavier@ig.com.br

