

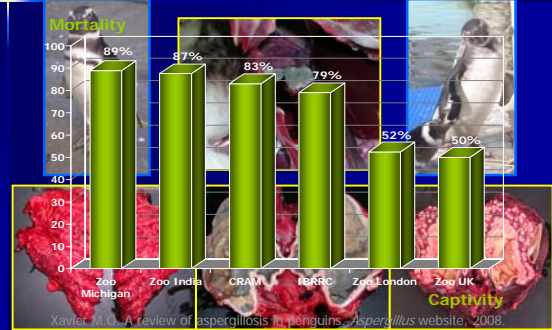


Effects of Oil on Wildlife
10th International Conference

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

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ASPERGILLOSIS IN PENGUINS



ASPERGILLOSIS IN PENGUINS Predisposition



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

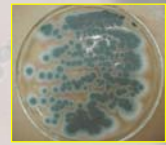


Redig PT, *Zoo and Wild Animal Medicine* 178-181, 1993;
Tell LA, *Med. Mycol.* 43:71-73, 2005.

ASPERGILLOSIS IN PENGUINS

✗ Difficulty in early diagnostic

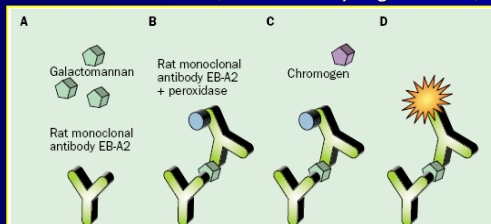
- Nonspecific clinical signs
- RX: late alterations
- Limitations
 - ✗ Mycology
 - Low sensitivity
 - ✗ Histopathology
 - Sample collection



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

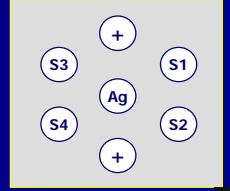
9 aspergillosis

3 malaria

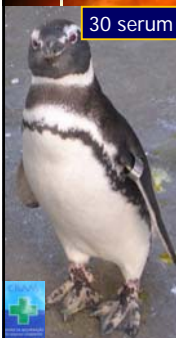
2 cachexia

21 healthy

Immunodiffusion



Material and Methods



30 serum

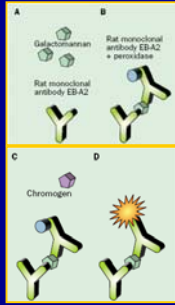
5 aspergillosis

3 malaria

2 cachexia

20 healthy

ELISA



Aspergillosis Gold standard

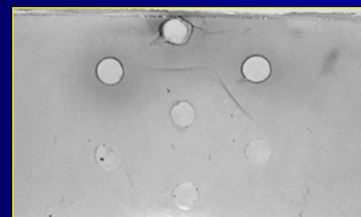


Material e Methods Statistical analyses

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

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 |

Reigiz198, 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!

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