Annual Reports of OIE Reference Laboratories and Collaborating Centres

Diagnostics • Vaccines • Training • Expertises • Standardisation

Rapports annuels des Laboratoires de référence et des Centres collaborateurs de l’OIE

Informes anuales de los Laboratorios de Referencia y Centros Colaboradores de la OIE
### Avian tuberculosis

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#### Summary of general activities related to the disease

1. **Test(s) in use/or available for the specified disease at your laboratory**

<table>
<thead>
<tr>
<th>Test (Total)</th>
<th>For</th>
<th>Specificity</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>ELISA (240)</td>
<td>Antibody</td>
<td>Sonicated antigen of <em>M. avium</em> subsp. <em>avium</em> (serotype 2)</td>
<td>240 domestic pigs</td>
</tr>
<tr>
<td>ELISA (240)</td>
<td>Antibody</td>
<td>Sonicated antigen of <em>M. avium</em> subsp. <em>hominissuis</em> (serotype 8)</td>
<td>240 domestic pigs</td>
</tr>
</tbody>
</table>
| Rapid agglutination (504) | Antibody  | Corpuscular antigen of *M. avium* subsp. *avium* (serotype 2)    | 482 domestic pigs  
| Rapid agglutination (504) | Antibody  | Corpuscular antigen of *M. avium* subsp. *hominissuis* (serotype 8)       | 482 domestic pigs  
| Rapid agglutination (504) | Antibody  | Corpuscular antigen of *M. intracellulare* (serotype 19)                  | 482 domestic pigs  
| Culture examination (3 395) | Mycobacteria | Conventional culture technique (media without Mycobactin J) | 332 environment  
| PCR (603)    | Isolates  | Quadruplex system for *M. avium* species¹ and *M. avium* complex members identification | 140 *M. avium* subsp. *avium* isolates  
| IS1245 RFLP (19) | Isolates  | Standardized method²                                                        | 19 *M. avium* subsp. *hominissuis*  
| IS901 RFLP (136) | Isolates  | Standardized method²                                                        | 136 *M. avium* subsp. *avium*  

¹ Other atypical mycobacteria
² Other atypical mycobacteria
³ Other atypical mycobacteria
### Test (Total) For Specificity Total

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</table>
| HAIN test (193) | Isolates | HAIN Lifescience, Nehren Germany | 18 *M. avium* subsp. *Avium*  
60 *M. avium* subsp. *Hominissuis*  
6 *M. peregrinum/ alvei/ septicum*  
5 *M. szulgai/intermedium*  
8 *M. Intracellulare*  
2 *M. Gordonae*  
3 *M. Fortuitum*  
1 *M. chelonea/ immunogenenum*  
1 *M. Chelonea*  
1 *M. Kansasii*  
2 *M. marinum/ ulcerans*  
1 *M. Marinum*  
1 *M. Simiae*  
1 *M. Parafortuitum*  
6 *M. Xenopi*  
1 *M. Terrae*  
2 *M. Genavense*  
1 *M. Interjectum*  
73 other atypical mycobacteria |

1 Home made technique for the identification of members of *M. avium* species and *M. avium* complex; paper under preparation.

2 Other non-identified mycobacterial species than members of *M. avium* species, *M. avium* complex and *M. tuberculosis* complex.


### Production and distribution of diagnostic reagents

Antigens and PCR kits for *M. avium* complex and *M. avium* species members were produced (see the Table).

A total of 10 ml of each antigen were supplied to The Netherlands.

### Activities specifically related to the mandate of OIE Reference Laboratories

#### 3. International harmonisation and standardisation of methods for diagnostic testing or the production and testing of vaccines

During the year 2006 we have co-operated with Dr. Dr. Henk Wisselink Ph.D. (Research Scientist, Animal Sciences Group, Wageningen UR, Division of Infectious Diseases, LELYSTAD, The Netherlands) in the field of serological diagnostics of *M. avium* complex infections in pigs.

### Preparation and supply of international reference standards for diagnostic tests or vaccines

None
5. **Research and development of new procedures for diagnosis and control**

Conventional “quadruplex” PCR system for the identification of members of *M. avium* species and *M. avium* complex was routinely used and paper is under preparation.

Quantitative real time PCR “triplex” system with internal amplification control for the detection of *M. avium* subsp. *avium* and *M. avium* subsp. *hominissuis* is now under the development.

6. **Collection, analysis and dissemination of epizootiological data relevant to international disease control**

IS901 RFLP analysis was carried out on the 136 *M. avium* subsp. *avium* isolates from following hosts from the Czech Republic: 88 hens, 40 experimentally infected domestic rabbits, 6 wild boar (*Sus scrofa*), 1 swan (*Cygnus olor*) and 1 pheasant (*Phasianus colchicus*).

Based on current published data (Pavlik et al., 2000; Dvorska et al., 2003, 2004; Bartos et al., 2006), it could be suggested that the causal agent of avian tuberculosis is *M. avium* subsp. *avium* of serotypes 1, 2 and 3 and genotype IS901+. Other members of *M. avium* species (*M. avium* subsp. *hominissuis* and *M. avium* subsp. *paratuberculosis*) are not able to cause miliary tuberculosis in bird’s parenchymatous organs except of *M. avium* subsp. *silvaticum*, which contains IS902 and is dependent on Mycobactin J like causal agent of paratuberculosis.

In pigs, the most common agent detected from tuberculous lesions in lymph nodes, is *M. avium* subsp. *hominissuis*, which is also very sporadically isolated from parenchymatous organs of different hosts (humans, birds etc.). Due to this fact, we suggest to describe these diseases as “avian mycobacteriosis”.

Pavlik I., Svastova P., Bartl J., Dvorska L., Rychlik I. Relationship between IS901 in the *Mycobacterium avium* complex strains isolated from birds, animals, humans and environment and virulence for poultry. *Clinical and Diagnostic Laboratory Immunology*, 2000, 7 (2), 212-217.


7. **Provision of consultant expertise to OIE or to OIE Member Countries**

Animal Sciences Group, Wageningen UR, Division of Infectious Diseases, Lelystad, The Netherlands, 16.-17.3.2006, serologically diagnostics of mycobacterial infections in pigs including avian tuberculosis.

8. **Provision of scientific and technical training to personnel from other OIE Member Countries**

**MVSc. Edmealem Shitaye Jembere** (Senior Epidemiologist responsible for exotic infectious diseases at Animal Health Department, Ministry of Agriculture Addis Ababa, Ethiopia), University of Veterinary and Pharmaceutical Sciences Brno, Faculty of Veterinary Medicine, 31.10.2004-31.6.2007: Study of epizootiology of infections caused by the members of *Mycobacterium avium* species in animals and birds.

Marija Kaevska, Faculty of Natural Sciences and Mathematics, Sts. Cyril and Methodus University, Skopje, Macedonia, 1.9.2006-30.6.2007: PCR detection of Mycobacterium avium subsp. avium in pig’s tissue samples.

Dr. Louis Fischer, Geschäftsführer, Labovet GmbH, Labor für Veterinärdiagnostik und Hygiene, Vienna, Austria, 8.9.2006: Diagnostics of mycobacterial infections in pigs including avian tuberculosis.

Dr. Jelle Thole, Animal Sciences Group, Wageningen UR, Division of Infectious Diseases, Lelystad, The Netherlands, 5.-7.3.2006: Serologically diagnostics of mycobacterial infections in pigs including avian tuberculosis.

Dr. Henk Wisselink Ph.D., Animal Sciences Group, Wageningen UR, Division of Infectious Diseases, Lelystad, The Netherlands, 5.-7.3.2006 and 15.-18.5.2006: Serologically diagnostics of mycobacterial infections in pigs including avian tuberculosis.

9. Provision of diagnostic testing facilities to other OIE Member Countries

Mycobacterial isolates of M. avium complex from Slovenia were identified.

10. Organisation of international scientific meetings on behalf of OIE or other international bodies

None

11. Participation in international scientific collaborative studies

Our laboratory was involved in the following national and international projects dealing with the development of different techniques for the diagnostic of infections caused by members of M. avium species including avian tuberculosis (caused by M. avium subsp. avium) or avian mycobacteriosis (caused by M. avium subsp. hominissuis):

- National grants


- European Union Grants:


12. Publication and dissemination of information relevant to the work of OIE (including list of scientific publications, internet publishing activities, presentations at international conferences)

- **Presentations at international conferences and meetings**


Pavlik I. (invited lecture): Bovine tuberculosis, paratuberculosis, avian tuberculosis and mycobacterioses in the Czech Republic during the last 15 years. Innsbruck, Austria, 7th June, 2006.


- **Scientific publications in peer-reviewed journals**


- Other communications


- Other publications related to mycobacteriology


