**SURVEILLANCE PROGRAMME**

Brucellosis in marine mammals is recognized as a zoonotic disease. Two different species of *Brucella*, *B. pinnipedialis* and *B. ceti*, have been described in pinnipeds and cetaceans, respectively. Transmission of *Brucella* in marine mammals is poorly understood, but both vertical and food chain transmission have been suggested.

The aim of this study was to evaluate the prevalence of *Brucella* infection among marine mammals, in order to assess the potential zoonotic risk of marine mammal Brucellae in the North Sea.

A *Brucella* surveillance program of stranded marine mammals on the coast of Belgium, France and Netherlands has been implemented since 1999. A total of 523 organ samples, from 207 marine mammals, were recovered between 1999 and 2013.

![Distribution of recovered animals (1999-2013)](image)

**BRUCELLA SCREENING**

Organs were cultured in Farrell medium for bacteriology detection. First, *Brucella* colonies were identified by colony morphology, microscopy and biochemical probes. A real-time PCR based on the Bcsp31 sequence was made in order to confirm the genus.

*Brucella* spp. was isolated in 7.2%, (15/207), of the stranded animals. The isolates were recovered from harbor porpoises (*Phocoena phocoena*) (n=6), harbor seals (*Phoca vitulina*) (n=5), grey seals (*Halichoerus grypus*) (n=3) and short-beaked common dolphin (*Delphinus delphis*) (n=1).

<table>
<thead>
<tr>
<th>Species</th>
<th>Total animals</th>
<th>Infected animals</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Harbour porpoise</td>
<td>137</td>
<td>6</td>
<td>4.4</td>
</tr>
<tr>
<td>Harbour seal</td>
<td>42</td>
<td>5</td>
<td>11.9</td>
</tr>
<tr>
<td>Grey seal</td>
<td>13</td>
<td>3</td>
<td>23.1</td>
</tr>
<tr>
<td>Stranded-beaked common dolphin</td>
<td>2</td>
<td>1</td>
<td>50.0</td>
</tr>
<tr>
<td>Others</td>
<td>6</td>
<td>0</td>
<td>0.0</td>
</tr>
<tr>
<td>Total recovered</td>
<td>207</td>
<td>19</td>
<td>7.2</td>
</tr>
</tbody>
</table>

Table 1: Infected animals recovered from 1999 to 2013.

As expected, *B. pinnipedialis* and *B. ceti* were detected in pinnipeds and cetaceans, respectively. *Brucella* was mainly found in lungs (n=9), bronchial lymph nodes (n=6) and prescapular lymph nodes (n=5) among the positive animals, showing the importance of these organs as targets for *Brucella* detection (Table 2).

**MLVA ANALYSIS**

Isolates were typed by MLVA (Multi Locus Variable Tandem Repeats Analysis) on the basis of 16 different markers. Graphical representation and edition of the phylogenetic tree were performed with TreeDyn.

Three clusters were found, and two corresponded to separated groups of *B. ceti*. One group was composed exclusively of harbor porpoises strains, while the second group only included the dolphin isolate. The third cluster was constituted of *B. pinnipedialis* strains from seals.

**CONCLUSIONS**

As a zoonotic disease, the presence of *Brucella* in marine mammals constitutes a biohazard for human health.

Different genetic profiles were identified by MLVA, demonstrating the strain variability of *Brucella* spp. circulating in marine mammals in the North Sea.

Further studies will be needed to study the spread of clonal strains among the marine mammal population.

In order to establish control actions, more studies on epidemiology and risk factors should be done.

**REFERENCES**

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