NRL activities in Hungary

Tamás Sréter
Laboratory of Parasitology, Fish and Bee Diseases
Veterinary Diagnostic Directorate
National Food Chain Safety Office
Budapest, Hungary

Short summary

- 109 public laboratories participated in three ring trials.
- The protocol of EURLP was followed.
- Number of samples: 1 negative and 4 positive (containing 3 and 5 larvae)
- Results: according to ICT criteria 53 laboratories had negative evaluation
- Training on critical points was followed by validation.
- Repeated PT in September

Environmental factors underlying distribution patterns of Alaria alata and Trichinella spp. in Hungary
Materials and methods

- Intestinal mucosa from 1612 red foxes was tested by SCT for Alaria alata infection in two collection periods (2008-2009, 2012-2013).
- 3,304 red foxes and 0.29 million wild boars were tested for Trichinella sp. infection from 2006 to 2013.
- Home ranges of infected and uninfected animals were analysed on the background of geographic vector data of altitude, land cover types, permanent water bodies, mean annual temperature, annual precipitation and soil permeability by Quantum GIS 1.8.0 software.
- Multiple regression analysis was performed with environmental parameter values and A. alata and Trichinella counts.

### Prevalence and intensity of Alaria alata infection

<table>
<thead>
<tr>
<th>Collection period</th>
<th>No. of foxes examined</th>
<th>Prevalence (95% CI)</th>
<th>Intensity (± SE)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008-2009</td>
<td>840</td>
<td>49.2 (47.7-51.1)</td>
<td>1.49 (± 0.04)</td>
</tr>
<tr>
<td>2012-2013</td>
<td>772</td>
<td>55.2 (53.4-57.0)</td>
<td>1.46 (± 0.03)</td>
</tr>
</tbody>
</table>

* Intensity of infection was measured by scoring (score 1: 1-20 worms; score 2: 21-40 worms; score 3: > 40 worms)

### Spatial distribution of Alaria alata in red foxes of Hungary

The darkness of the circles is in line with the intensity of infection (light grey: 1-20 worms; grey: 21–40 worms; black: > 40 worms).

### Environmental determinants of the spatial distribution of Alaria alata in red foxes of Hungary

- Lack of permanent water bodies, mean annual temperature, annual precipitation and soil permeability were the determinants of the spatial distribution of A. alata.
- The lack of permanent water bodies results in the use of temporary biotopes by the second intermediate hosts, frogs. In these biotopes, lymnaeid snails (pond snails) might be the first intermediate hosts. Temporary biotopes are more easily contaminated with the faeces of the final hosts (e.g. red foxes) containing eggs than permanent water bodies.
- The higher temperature, the lower precipitation and the higher soil permeability leads to earlier desiccation of temporary biotopes, and tadpoles and frogs infected with mesocercariae can be more easily predated by the final hosts (e.g. red foxes).
Prevalence and intensity of *T. spiralis* and *T. britovi* infection in red foxes and wild boars

<table>
<thead>
<tr>
<th></th>
<th><em>T. spiralis</em></th>
<th><em>T. britovi</em></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Prevalence (%)</strong> (95% CI)</td>
<td>0.24 (0.16-0.32)</td>
<td>0.0004 (0.003-0.0005)</td>
</tr>
<tr>
<td><strong>Intensity (± SE)</strong></td>
<td>3.2 ± 1.0</td>
<td>33.2 ± 25.8</td>
</tr>
</tbody>
</table>

Spatial distribution of *Trichinella* spp. in Hungary

Symbols: uninfected and *Trichinella spiralis* infected red foxes (*Vulpes vulpes*) (circles) and wild boars (*Sus scrofa*) (triangles).

Environmental determinants of the spatial of *Trichinella spiralis* in Hungary

- No correlation was found between environmental parameter values in the home range of foxes and wild boars and the *T. spiralis* larval counts.
- There was a positive correlation between the boundary zone of Hungary and *T. spiralis* infection (*P* < 0.0001; odds ratio: 24.1).
- The distribution of *T. spiralis* in the Hungarian wildlife is determined by the transborder transmission of the parasite from the surrounding endemic countries.

Environmental determinants of the spatial distribution of *Trichinella britovi* in Hungary

- Non-agricultural areas (forests, scrub, herbaceous vegetation and pastures) and the mean annual temperature were the major determinants of the spatial distribution of *T. britovi*.
- The positive correlation with non-agricultural areas can be explained by the generalist feeding behaviour including scavenging of foxes in these areas.
- In agricultural areas, foxes are specialist predators due to prey profitability (small rodents).
- The negative correlation with the mean annual temperature can be attributed to the slower decomposition of wildlife carcasses favouring a longer survival of *T. britovi* larvae in the host carrion and to the increase of scavenging of foxes.
Thank you for your attention.