Spatio-temporal abundance of Culicoides on a local scale

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Spatio–temporal abundance of *Culicoides* on a local scale

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Introduction

Culicoides

- ♀ suck blood
- 500 species ~ 40 in Denmark
- 1-2mm
- Parasites: protozoans, nematodes
- Virus: Bluetongue, African Horse Sickness, Akabane Virus, Schmallenberg…
Aim

- Local scale abundance:
  - Spatial factors?
  - Temporal factors?

- Predictable?
Field work

- 50 light traps – 50*50 m grid
- Distance to breeding sites
- Temperature
- Wind speed
Field work

- Turbulence
- Humidity
- Precipitation
Field work

- Host animals
- Windbreaks
- Transect of sheep
Field work

- Sheep transect
Catches

- 16 catch nights * 50 light traps ~ 800 samples

<table>
<thead>
<tr>
<th>Catch night</th>
<th>A1</th>
<th>A2</th>
<th>B1</th>
<th>C1</th>
<th>C2</th>
<th>C3</th>
<th>E1</th>
<th>E2</th>
<th>E3</th>
<th>F1</th>
<th>F2</th>
<th>F3</th>
<th>F4</th>
<th>G1</th>
<th>G3</th>
<th>G4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obsoletus group</td>
<td>4</td>
<td>872</td>
<td>316</td>
<td>173</td>
<td>522</td>
<td>612</td>
<td>2</td>
<td>93</td>
<td>95</td>
<td>29</td>
<td>427</td>
<td>1086</td>
<td>1</td>
<td>253</td>
<td>2</td>
<td>1</td>
</tr>
<tr>
<td>Pulicaris group</td>
<td>15</td>
<td>8015</td>
<td>1524</td>
<td>750</td>
<td>621</td>
<td>952</td>
<td>4</td>
<td>190</td>
<td>223</td>
<td>33</td>
<td>817</td>
<td>1745</td>
<td>8</td>
<td>260</td>
<td>5</td>
<td>4</td>
</tr>
</tbody>
</table>
Modeling

Regression model ➔ Autocorrelation

CAR Model
Results

• Distance to sheep
• Temperature
• Wind speed
Results

- Turbulence
- Humidity
- Precipitation
- Sheep transect
Results

• Uncertainty: 20% – 300%

• Significant spatial autocorrelation

• Temporal autocorrelation insignificant

• Dynamic pattern: 4 or 11 times higher abundance
Results
Spatial abundance and clustering of Culicoides (Diptera: Ceratopogonidae) on a local scale

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For all author emails, please log in.

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Abstract (provisional)

Background
Biting midges, Culicoides, of the Obsoletus group and the Pulicaria group have been involved in recent outbreaks of bluetongue virus and the former was also involved in the Schmallenberg virus outbreak in northern Europe.
Thank you
Questions are welcome

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