**Performance of the Abaxis VetScan® Canine Anaplasma Rapid Test**

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**Introduction**

The genus *Anaplasma* consists of tick-transmitted gram-negative obligate intracellular bacteria from the order *Rickettsia* and family *Anaplasmataceae* that primarily infect white blood cells, red blood cells, and platelets of their mammalian hosts. The most relevant species found in canines at this time are *A. phagocytophilum* and *A. platys.*

Anaplasmosis is transmitted via Ixodes ticks. Specifically, *Anaplasma* may be transmitted by the deer tick, with different species distributed throughout the United States and Europe. *Ixodes scapularis* is found in the Northeast and the Midwest. *Ixodes pacificus* is found in the western United States and western Canada. *Ixodes ricinus* is found in Europe. The vector of *A. platys* has not been definitively identified, but is thought to be one or more species of ticks, e.g. *Rhipicephalus sanguineus.* *A. platys* infection is found worldwide, and its vector(s) likely also has (have) worldwide distribution.

The incubation period of *A. phagocytophilum* patients is typically 1 to 2 weeks. *A. phagocytophilum* is an obligate parasite of neutrophils that may cause dysfunction and immune depression of the host neutrophils. The incubation period of *A. platys* is usually 8 to 15 days. Thrombocytopenia is common in *A. platys* infection. After the disappearance of the bacteria, platelet counts rebound rapidly within 3 to 4 days. This process is cyclical, recurring every 2 weeks with decreasing severity.

Common physical signs for Anaplasmosis are often fever, lethargy and/or depression, anorexia, musculoskeletal pain, vomiting, diarrhea, and/or cough. Anaplasmosis does not seem to produce a chronic disease state as is seen with *Ehrlichia* infections.

**Materials and Methods**

Three hundred thirty eight samples were obtained from multiple private practices, humane societies and laboratories and determined to be either *Anaplasma* positive or negative by evaluation with immunofluorescence assay (IFA), Abaxis ELISA, and a commercial test kit. The IFA tests were carried out at Abaxis Veterinary Reference Laboratory (AVRL) in Olathe, KS using commercial reagents. Samples were further classified as either *A. phagocytophilum* or *A. platys* by using an algorithm that included IFA, ELISA and a commercial kit. The data from the testing was tabulated and compared to results based on visual observations for the VetScan® Canine Anaplasma Rapid Test.

No single test can be relied upon as a “gold standard” for *Anaplasma*. Therefore, the criterion for a sample to be negative was that at least two out of three tests (IFA, ELISA, and commercial test kit) were negative for that sample. Likewise, the criterion for a sample to be positive was that at least two of the three test methods were positive.

**Results**

The sensitivity and specificity of the Abaxis Anaplasma kit for 338 samples is given below.

<table>
<thead>
<tr>
<th>Results</th>
<th>VetScan Canine Anaplasma Rapid Test</th>
<th>VetScan Canine Anaplasma Rapid Test</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Negative</td>
<td>Positive</td>
</tr>
<tr>
<td>Negative based on negative criterion</td>
<td>205</td>
<td>14</td>
</tr>
<tr>
<td>Positive based on positive criterion</td>
<td>3</td>
<td>116</td>
</tr>
</tbody>
</table>

Sensitivity for *A. phagocytophilum* = 97.5 (95% CI: 92.3 - 99.3%)
Specificity = 93.6 (95% CI: 89.3 - 96.3%)

Results for *A. phagocytophilum*
In a subset of the positive samples above, 27 samples were determined to positive for the presence of *A. phagocytophilum* antibodies based on the algorithm in Materials and Methods. The results of Abaxis lateral flow testing versus these samples are given in the table below.

<table>
<thead>
<tr>
<th>Results</th>
<th>VetScan Canine Anaplasma Rapid Test</th>
<th>VetScan Canine Anaplasma Rapid Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>All criteria positive for <em>A. phagocytophilum</em></td>
<td>2</td>
<td>25</td>
</tr>
</tbody>
</table>

Sensitivity for *A. phagocytophilum* = 92.6% (95% CI: 75.7 - 99.1%)
Results for *A. platys*

Another subset consisting of 33 samples determined to be positive for *A. platys* antibodies using the algorithm. The results of Abaxis lateral flow testing versus these samples are given in the table below.

<table>
<thead>
<tr>
<th>Results</th>
<th>VetScan Canine Anaplasma Rapid Test Negative</th>
<th>VetScan Canine Anaplasma Rapid Test Positive</th>
</tr>
</thead>
<tbody>
<tr>
<td>All criteria positive for <em>A. platys</em></td>
<td>2</td>
<td>31</td>
</tr>
</tbody>
</table>

Sensitivity for *A. platys* = 93.9% (95% CI: 79.8 - 99.3%)

**Conclusions**

This study demonstrates that the VetScan Canine Anaplasma Rapid Test is a reliable, cost-effective and time-saving point of care assay used to detect the presence of antibodies against *Anaplasma* species infections in the canine, allowing for effective diagnosis and treatment of infected patients.

**Bibliography**