

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.¹ The most relevant species found in canines at this time are *A. phagocytophilum* and *A. platys*.²

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.³ *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.⁴

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.⁵ 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.⁶

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.⁷

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.

Results	VetScan Canine Anaplasma Rapid Test Negative	VetScan Canine Anaplasma Rapid Test Positive
Negative based on negative criterion	205	14
Positive based on positive criterion	3	116

Sensitivity = 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.

Results	VetScan Canine Anaplasma Rapid Test Negative	VetScan Canine Anaplasma Rapid Test Positive
All criteria positive for <i>A. phagocytophilum</i>	2	25

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.

Results	VetScan Canine Anaplasma Rapid Test Negative	VetScan Canine Anaplasma Rapid Test Positive
All criteria positive for <i>A. platys</i>	2	31

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

Discussion

Canine *Anaplasma* infection status is not only evaluated in sick patients, but also in annual screening tests of asymptomatic, chronically infected animals in endemic regions. Diagnosis of Anaplasmosis is based on serologic and/or microscopic findings and supported by relevant history.

The VetScan Canine Anaplasma Rapid Test offers a cost-effective and time saving option and provides an excellent sensitive and specific test for the detection of *Anaplasma* species.

Conclusions

This study demonstrates that the VetScan Canine Anaplasma Rapid Test is a reliable, cost-effective and timesaving 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

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