



## The Truth of Accuracy: 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.<sup>1</sup> The most relevant species found in canines at this time are *A. phagocytophilum* and *A. platys*.<sup>2</sup>

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.<sup>3</sup> *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.<sup>4</sup>

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.<sup>5</sup> 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.<sup>6</sup>

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.<sup>7</sup>

### 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
<b>Negative</b> based on negative criterion	205	14
<b>Positive</b> 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.

## IDEXX Claims Against the Abaxis VetScan Canine Anaplasma Rapid Test

IDEXX claims poor sensitivity of the Abaxis VetScan Canine Anaplasma Rapid Test without providing sufficient information about the testing and results to consider the claims valid. Comparing the data presented here with what IDEXX presented, many differences between the data sets should be evident:

### 1. The samples obtained for the Abaxis study were from clinical sites around the country.

IDEXX's internally generated study does not disclose the source of the samples, which could potentially bias the data. Without appropriate documentation of the sampling set, the results should be considered inherently biased.

### 2. The Abaxis data compares results from different methodologies.

IDEXX uses its own test (proprietary ELISA) as the "gold standard" so the methodologies are essentially testing for the same marker in the same way for SNAP yet different for the VetScan Canine Anaplasma Rapid Test. This would of course lead to a higher level of agreement for the SNAP test.

### 3. The Abaxis data presented was submitted to the USDA for the approval of the VetScan Canine Anaplasma Rapid Test.

The IDEXX study was created to show a weakness in a competitive product that simply does not exist when research is conducted in a balanced and prudent manner and evaluated as an accurate comparison.

### 4. The VetScan Canine Anaplasma Rapid Test has been approved by the USDA to evaluate for *A. phagocytophilum* and *A. platys*.

Based on the multi-site testing data set described above and submitted to the USDA, IDEXX's claims of inaccuracy are unsubstantiated. There are too many incorrect assumptions and variables in the IDEXX comparison for the data to be considered the result of a credible study.

## Bibliography

- <sup>1</sup>Brown WC. (2012). Adaptive immunity to Anaplasma pathogens and immune dysregulation: implications for bacterial persistence. *Comp Immunol Microbiol Infect Dis*, 35(3), 241-52.
- <sup>2</sup>Little, S.E. (2010). Ehrlichiosis and anaplasmosis in dogs and cats. *Vet Clin North Am Small Anim Pract*, 40(6), 1121-40.
- <sup>3</sup>Berrada Z.L., & Telford, S.R. 3rd. (2009). Burden of tick-borne infections on American companion animals. *Top Companion Anim Med*, 24(4), 175-81.
- <sup>4</sup>Green, Craig, E. (2012). *Infectious Diseases of the Dog and Cat 4th Edition*. Athens, Ga: Elsevier, 227-259.
- <sup>5</sup>Carrade D.D., Foley J.E., Borjesson D.L., & Sykes J.E. (2009). Canine granulocytic anaplasmosis: a review. *J Vet Intern Med.*, 23(6), 1129-41.
- <sup>6</sup>Sainz, A., Roura, X., Miro, G., Estrada-Pena, A., Kohn, B., Harrus, S., & Solano-Gallego, L. (2015). Guidelines for veterinary practitioners on canine ehrlichiosis and anaplasmosis in Europe. *Parasites & Vectors*, 8:75.
- <sup>7</sup>Foglia Manzillo, V., Cappiello S., & Oliva G. (2006). Tick-transmitted diseases in dogs: clinicopathological findings. *Parassitologia*, 48(1-2), 135-6.