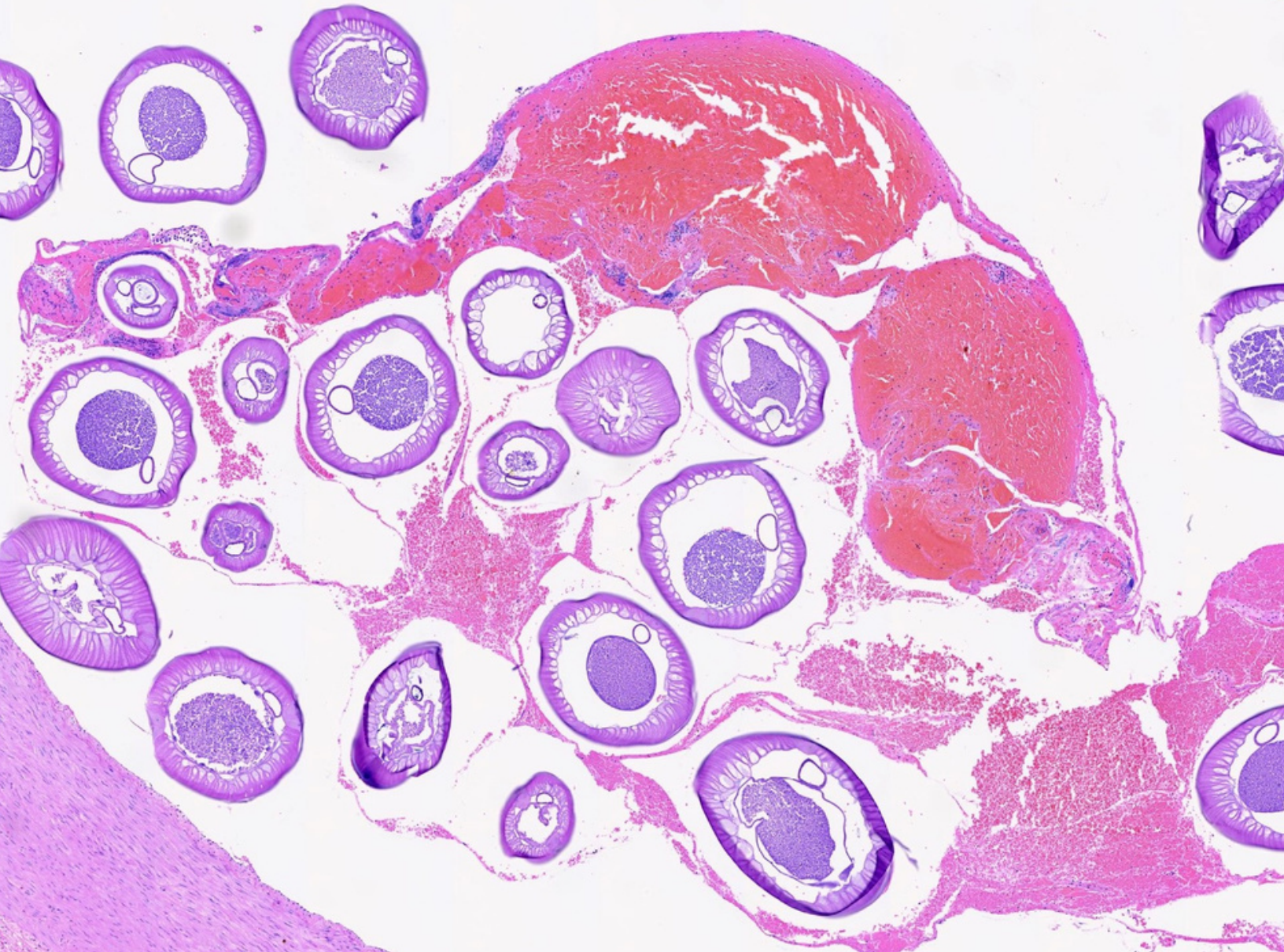


**The University of Wyoming
Department of Veterinary Sciences
& Wyoming State Veterinary
Laboratory Newsletter**



**Elaeophera in the carotid of a
Shiras Moose**

UPDATES

Dr. Jonathan Fox, Department Head



Dr. Kerry Sondgeroth, WSVL Int Director



Welcome to the combined summer/fall edition of the Veterinary Sciences Department / WSVL newsletter. We aim to get back to quarterly issues but currently are building back to full front office staffing. We have had quite a few faculty changes since the spring and I would like to take this opportunity to highlight these. Dr. Sondgeroth, Associate Professor, bacteriologist, and Wyoming native stepped into the role of interim WSVL director in July. Those of you who know Dr. Sondgeroth will appreciate that we are fortunate to have her in this important role. We have had three faculty departures from the department recently. Dr. O'Toole retired after 32 years of service at UW. His expertise in pathology and diagnostic veterinary medicine will be missed, as will his engagement in the department and UW. Dr. Cornish, wildlife pathologist, moved onto a new position after 22 years' service in the department. His expertise will also be missed. Finally, Wyoming Excellence Chair in Disease Ecology, Dr. Holly Ernest retired after 8 years of service in the department. We wish them well in their new endeavors. We are fortunate to have two new faculty join the department. Dr. Brett Webb, Associate Professor, joined us in June from the North Dakota State University Veterinary Diagnostic Laboratory. He is a pathologist with expertise in infectious disease of livestock. Dr. Amy Rhoad also joined the department recently as an instructional professor. She obtained her bachelor's degree from UW and her PhD from this department. Dr. Rhoad will teach mainly within the LIFE program, based within the new College of Agriculture, Natural Resources, and Life Sciences. Finally, due to challenges in recruiting pathologists we were fortunate to have Dr. Flaviu Tabaran join the department for 10 weeks over the summer as a locum pathologist. Dr. Tabaran is from Romania, and trained in pathology in part at the University of Minnesota. In this issue, we provide highlights on Drs. Webb, Rhoad and Tabaran.

Please enjoy reading the newsletter; feel free to provide us feedback or reach out with questions.

Hi! I am excited to introduce myself as the Interim Director of WSVL. Dr. Will Laegreid stepped down at the end of June, following a decade of service to WSVL. We thank him for the time and energy he invested into WSVL. I have been a member of WSVL since 2014, when I began as supervisor of the Bacteriology Section. In 2021 I also became the supervisor of the Diagnostic and Regulatory Serology Sections. I recognize that I have big shoes to fill, and appreciate feedback for what WSVL can be doing better for our clients.

The WSVL Advisory Council has been re-established, with the first meeting held this summer, and another planned around the Winter WVMA meeting in Casper in December. The Council consists of 6 volunteers, and we are so thankful for these folks and their willingness to provide direction and support to WSVL. The council members are Dr. Bob Beiermann, Dr. Mike Driscoll, Dr. Fred Emerich, Dr. Gunda Gamble, Dr. Hallie Hasel, and Steve True.

We are fortunate to have new faces at WSVL, including three Senior Office Associates (Lindsey White, Clayleen Rivord, and Alex Terry), and UWBF Laboratory Technician II (Douglas Sandidge) who will support our researchers in the BSL-3/Select Agent Registered space. We continue to advertise for a permanent Senior Accountant, a Laboratory Technician III necropsy position, and a Laboratory Technician III sequencing position. All positions can be found on the UW HR website if you or someone you know is interested in working at WSVL!

WSVL has updated our client list, so that all of our communication can be sent through email. This allows for electronic reports, invoicing, updates regarding test availability, lab closures, and other disease announcements. On our [client services](#) webpage, we have information regarding online results access, paying your bill online, and using our inbound UPS discounted shipping. If you have any questions about these tools, please contact us by phone at 307-766-9925 or by email at vetrec@uwyo.edu. Also, don't forget that we DO have social media pages—Instagram ([wystatevetlab](#)) and Facebook (Wyoming State Veterinary Laboratory), so you can “follow us” and be connected in real time.

I look forward to seeing some of you at the WVMA meeting in Casper in two months!

Meet the Faculty

DR. BRETT WEBB
PATHOLOGIST
ASSOCIATE PROFESSOR



Education:

BS – University of Southern Colorado
DVM – Colorado State University
PhD – Colorado State University
Diplomate – American College of Veterinary Pathologists (anatomic pathology)

What lead you to focusing on pathology instead of other veterinary specialties?

I didn't enjoy clinical practice and was always intrigued by the mechanisms of disease underlying the illnesses that I saw. Understanding the pathogenesis of a disease is the first step in developing treatments or cures. Pathology is a power tool that enables one to work with and impact entire populations of animals on a greater extent than what can often be achieved in clinical practice.

Is there any ongoing research you are working on, that you can discuss?

A collaborator at USDA ARS has developed vaccine candidates for sheep associated malignant catarrhal fever caused by ovine herpesvirus 2. Early next year we will be starting a series of trials for these vaccine candidates in bison. MCF which is typically fatal can be transmitted to many ungulates, but bison are the species most affected by the disease in the US. Currently there is no successful treatment or vaccine available for this disease.

I also have active research collaborations with two other groups that are working on vaccine development and underlying mechanisms in a variety of viral diseases include those caused by influenza virus, coronavirus, small DNA viruses and coinfections with viral and bacterial pathogens.

What are your longer term research goals?

My long-term goals are to keep working on vaccine development and understanding mechanisms of coinfections including interactions of pathogens with underlying the bacterial and viral microbiome and comorbid conditions.

What attracted you to the University of Wyoming?

After working in North Dakota for 10 years I was ready to get back to the mountain west. I am originally from southcentral Colorado, where most of my family lives so an opportunity to be closer to family was attractive. The department has expansive animal facilities for research which was attractive as the lack of facilities for infectious disease research was a limiting factor in my previous position.

Are there any hobbies or interests you enjoy?

I enjoy being outdoors. Anything that will get me outside. Cross country skiing, hiking, hunting and fishing are just a few.



NEW DEPARTMENTAL GRANTS

TITLE: Assessing factors that influence the virulence of *Mycoplasma bovis* in bison
(Bison bison)

SPONSOR: South Dakota State University

FACULTY ASSOCIATED: Dr. Kerry Sondgeroth, Dr. Jennifer Malmberg

\$208,000

Meet the Faculty

DR. AMY RHOAD
INSTRUCTIONAL PROFESSOR



Education:

B.S. in Microbiology, B.S. in Molecular Biology/Environmental and Natural Resources 2014
PhD in Animal & Veterinary Sciences, minor in Quantitative Research Methods 2020
All from UW

Research Interests:

Microbial Ecology, Bioinformatics, Teaching and Learning Assessment with specific focus in Course Alignment

You completed your undergraduate and PhD degrees at UW. What attracted you to the University of Wyoming and what advice would you give to those pursuing a graduate degree?

I grew up in Cody, Wyoming. With UW having exceptional biological programs, it was a great close to home option for an undergraduate degree, especially when my parents moved to Cheyenne. My dad was working with wildlife with the Bureau of Land Management, and my mom was a biological educator in the school system. My background in microbiology and molecular biology really kicked in my first semester. I knew this was a science I wanted in my life. Through my advisor, Learning Active Mentoring Program Director Rachel Watson, I was encouraged to pursue a graduate degree, and Dr. Kerry Sondgeroth offered me an opportunity to study the effect of the microbiome on toxoplasmosis. My main advice is be willing to put in the worktime to obtain your goals, network where you can, and develop the mindset, "watch me" when told that "you cannot do this."

You have just started your current position as an instructional professor in the LIFE program. Is there a specific area of teaching you enjoy focusing in, what interests you the most about that area?

I would say several things interest me in teaching. Specifically, micro and molecular biology, because of the complex and intricate microorganisms that exist in something as simple as a drop of water. The smallest drop of water can contain millions of tiny organisms that lead to areas of research that produce years of information and testing. I can then convey this to students and watch for that lightbulb moment, when the concept is understood. I think that's a pretty neat and special experience.

Your office is located in the ENZI Science, Technology, Engineering, and Mathematics (STEM). Tell us about this.

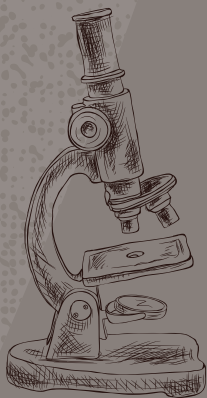
The STEM building has provided me with a vast amount of resources that support my teaching style as a non-traditional instructional professor. Being walking distance from our labs allows me to administer projects when the students are working. Each lab has individual state of the art tools ranging from geological, plant and fungus, and animal biology sciences. We do our best to accommodate the students with all the tools they need for success, and having focused groups of students. With my team, we are able to utilize the STEM building as a whole.

What are your long term aspirations for this position?

Long term goals for me are to focus on teaching and have involvement in microbiology. I am committed to integrating interdisciplinary approaches into these large crossover classes. General Biology has over eighty crossover majors relating to specific fields. It can feel overwhelming to someone new in academia; if students aren't learning then what's the point? I would love to provide a resource in helping students reach their desired biological field or find a niche across campus.

Are there any hobbies or interests you enjoy?

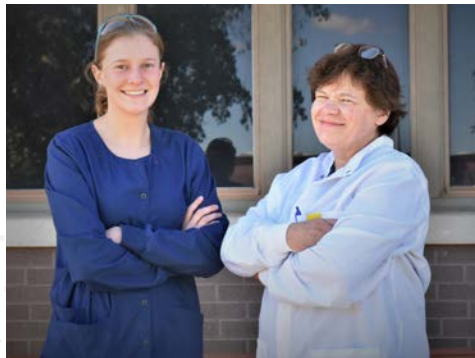
Fishing, hunting and rafting are a few things I enjoy doing locally. I also love to scuba dive! When time permits, my husband and I enjoy travelling to locations like Jamaica, Barbados, Belize, and the Bahamas to experience the local aquatic scene. Species identification and reef life are parts of the dive we relish. My farthest decent is 135ft, so I have to be mindful of nitrogen narcosis when swimming back up!



College of Agriculture
and Natural Resources
Veterinary Sciences

It Takes a Team

Serology



(Left) Kali Fernald, Temporary Technician, Regulatory Serology
&

(Right) Joan Edwards, Laboratory Technician III, Diagnostic Serology

DID YOU KNOW?

That WSVL runs over 80,000 samples for Brucellosis testing EACH YEAR? The majority of this testing occurs between October and February, and requires all hands on deck! We utilize undergraduate students, temporary contract technicians from the Wyoming Livestock Board, and of course our own full time technicians. (photo-LW taken on Wed)



(Back) Madison Chapin, Kali Fernald, Elisabeth Dooley, Morgan Statman, Shannon Goede, Andromeda Erikson

(Front) Samantha Clinton, Joan Edwards, Tucker Bean

A NOTE FROM THE LAB

DISEASE UPDATES,

Avian Influenza: We continue to see positive highly pathogenic avian influenza cases in our wild bird populations across the state. Thus far in 2022, WSVL has tested nearly 400 birds, with 100 positives. Prior to 2022, we typically tested around 100 samples per year.

Plague: WSVL diagnosed a case of plague in a feral cat from Albany, County in September. As long as there are fleas surviving the cold nights, plague is still considered a differential for sudden die offs in small rodents as well as sick indoor/outdoor cats and dogs.

Rabies: We continue to provide Rabies surveillance for free. At the end of September we had tested 403 samples, with 13 positives. One of the positive samples was from a bat found in a child's bedroom, thus we encourage submissions of bats with known human contact. In addition to bats, other positive samples this year have been from skunks and cattle. See our rabies webpage for a map of counties with positive samples, and other rabies resources.

More information for these diseases can be found on our website [here](#)

Strongyloides stercoralis infection in a dog from Wyoming



Dr. Flaviu Tabaran

Dr. Flaviu Tabaran served for 10-weeks over the summer as a locum pathologist at the WSVL. We enjoyed having Flaviu join us and he took full advantage of the Wyoming summer. Flaviu received his DVM degree from the University of Agricultural Sciences and Veterinary Medicine, Cluj-Napoca, Romania. He completed part of his anatomic pathology training at the University of Minnesota and is board-certified by the American College of Veterinary Pathologists (anatomic pathology). He will continue to contribute to the WSVL pathology service in 2023, as a digital pathologist focusing on biopsy cases.

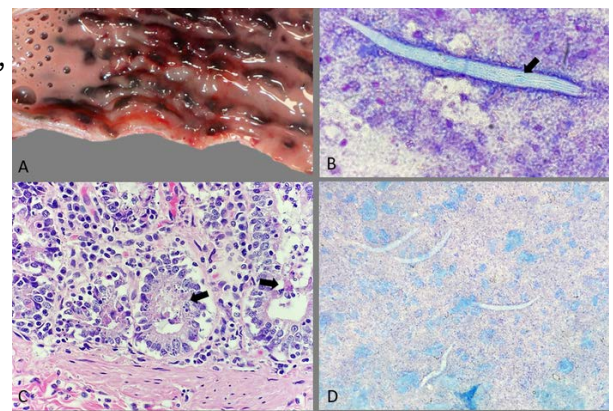
Strongyloides stercoralis (also referred to as the “human threadworm”) is a zoonotic /inverse zoonotic soil-transmitted helminthiasis with a cosmopolitan distribution [2,4]. Strongyloidiasis affects humans, dogs, wildlife-canides and in a lesser amount cats [13,16], having a higher prevalence in tropical and subtropical regions and emerging status in several areas of the world [11,14]. Infections are more common in young animals, particularly puppies in shelters and breeding kennels [3,4,9,].

Case description. A five-month-old French Bulldog female measuring 4.6lb was presented for an autopsy following a clinical history of failing to thrive, diarrhea and weakness. The clinical blood biochemistry carried out one day before autopsy submission showed hypercreatinemia (1.9 mg/dL), increased blood urea nitrogen (49 mg/dL), an increase in total proteins (7.9 g/dL), and globulins (4.5 g/dL), alanine transaminase (246 U/L), Na (168 mmol/L) and Cl (120 mmol/L). Mild neutrophilia (12.97 K/ μ L) was the only change observed at the hemoleucogram. The autopsy revealed marked dehydration, multifocal ulcerative gastritis (affecting mainly the pyloric area), diffuse hemorrhagic enteritis, and typhlocolitis (Fig 1, A) associated with Peyer's patch necrosis and moderate mesenteric and ileocecal lymph nodes reaction. In addition, histopathology revealed mainly within the small intestine multifocal villi necrosis, blunting and fusion, intestinal crypt necrosis (Fig 1, C), lymphoid depletion/lymphocytolysis, and coalescing interstitial pneumonia (lymphocytic, moderate).

Direct smears and wet mounts carried from the intestinal content during the autopsy revealed the presence of many small Nematoda larvae with a short buccal canal, and rhabdoid esophagus (consistent with *Strongyloides* spp. larvae) (Fig 1, B and D), admixed with necrotic cell debris, blood, a few inflammatory cells, polyspecific bacteria, and desquamated intestinal epithelial cells. Also, *Giardia* spp trophozoites were seen in fecal wet mounts.

Interestingly, despite two previous negative tests for Canine Parvovirus (CPV), carried by rapid enzyme immunoassay stool tests, the PCR test provided from samples collected during autopsy detected the presence of CPV2. The tissue samples tested negative for *Cryptosporidium* spp and Canine Coronavirus.

Severe hemorrhagic enteritis and typhlocolitis associated with a polyspecific viral and parasitic infection (Canine Parvovirus, *S. stercoralis*, and *Giardia* spp.) were considered the most likely cause of death.



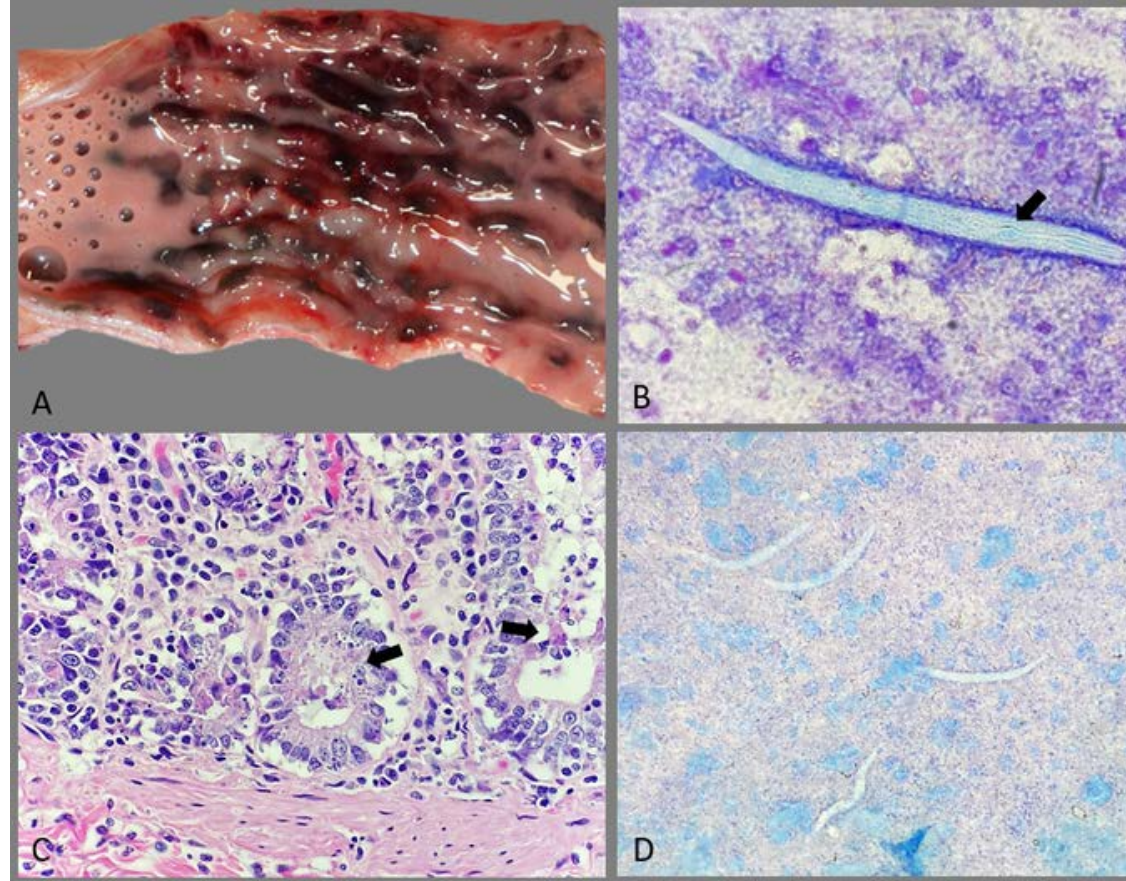


Fig 1. Gross, histopathologic and cytologic images from a case of *S. stercoralis* infection in a dog. The colon is diffusely congested, with multifocal mucosal erosions and a moderately hemorrhagic content (image A). Multiple parasitic larvae (images B and D) with a rhabdoid esophagus (image B, arrow) consistent with *Strongyloides* spp. larvae are observed. Multifocal crypt necrosis and luminal distension (image C, arrows) and diffuse infiltration of the deep lamina propria by lymphocytes, macrophages, and plasma cells are present within the small intestine.

How do animals become infected by *S. stercoralis*? The routes of contamination with *S. stercoralis* are: oral (considered the major ones), percutaneous (forming typical subcutaneous serpiginous tracts/“larva currens”), and rarely lactogenic. In addition to environmental infection, *S. stercoralis* can also undergo autoinfection (by both digestive and cutaneous routes) in which repeated parasitic generations develop in the same host individual [1,4,12].

How *S. stercoralis* infections evolve clinically? The severity of clinical signs varies depending on the severity of the infection, from mild, subclinical to severe, lethal evolution. Symptomatic strongyloidiasis is mainly observed in young animals or puppies. The clinical pattern consists of a succession of (1) cutaneous manifestations (“larva currens”), usually difficult to be observed due to the short period of migration, (2) bronchopneumonia, and (3) digestive symptoms, ranging from watery or mucoid to hemorrhagic diarrhea in severe infections. Neurological signs are occasionally reported [3,4,10].

How *S. stercoralis* infections are diagnosed? Microscopic examination and detection of the rhabditiform larvae in freshly passed stools by direct smears or larvoscopy following Baermann testing is usually used for a definitive diagnosis of *S. stercoralis* infections. Due to the low and intermittent shedding of larvae in most cases, at least three serial stool samples are recommended for diagnosis. *S. stercoralis* eggs are rarely identified in feces. Other diagnosis techniques such as stool culture, serodiagnosis and molecular diagnosis on stool samples have limited utilization [4,6,7,15].

Zoonotic risk: *S. stercoralis* is considered a zoonotic parasite (the main source of transmission being the dog), but recently two genetically different *S. stercoralis* populations are shown to exist, one that appears to be a dog-specific strain and the other having the potential to be transmitted to humans [5,8].

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SEQUENCING/BIOINFORMATICS

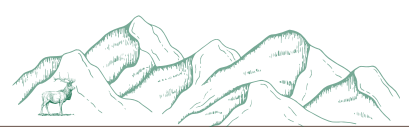
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Send your wildlife photography to us for a chance to be featured in our next newsletter. Send photographs to aterry4@uwyo.edu

HAVE FEEDBACK?

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College of Agriculture and Natural Resources
Veterinary Sciences

THE WORLD NEEDS
MORE COWBOYS.