

Appendix A

Complete list of 594 pathogens identified in canines categorized by the following taxonomical groups: bacteria, ectoparasites, fungi, helminths, protozoa, rickettsia and viruses. Pathogens deemed to be zoonotic as per the author's definition have been **bolded**; sapronoses are specifically denoted by a **❖**. If the dog is involved in transmission, maintenance or detection of the pathogen it has been further underlined. (Note: Grey-zone pathogens (Appendix B) have potential for but no confirmed involvement with dogs and are not underlined.) Of these, if the pathogen is reported in dogs in Canada (Tier 1) it has been denoted by an *. If the pathogen is reported in Canada but canine-specific reports are lacking (Tier 2) it is marked with a ^C (see also Appendix C). Finally, if the pathogen has the potential to occur in Canada (Tier 3) it is marked by a ^D (see also Appendix D).

Bacteria

Acholeplasma laidlawii

Acinetobacter baumannii

Actinobacillus

actinomycetemcomitans^C

Actinobacillus lignieresii

Actinomyces bovis

Actinomyces bowdenii

Actinomyces canis

Actinomyces catuli

Actinomyces coleocanis

Actinomyces hordeovulneris

Actinomyces hyovaginalis

Actinomyces israelii

Actinomyces naeslundii

Actinomyces neuii subsp.

anitratu^C

Actinomyces odontolyticus

Actinomyces turicensis

Actinomyces urogenitalis

*Actinomyces viscosus**

Actinomyces weissii

Aliarcobacter butzleri^C

Aliarcobacter cryaerophilus^C

Anaerobiospirillum

succiniciproducens^C

Anaerobiospirillum thomasi^D

Archanobacterium pyogenes

Bacillus anthracis^C

Bacillus circulans^C

Bacillus subtilis^D

Bacteroides spp.^C

Bartonella clarridgeiae

Bartonella elizabethae

*Bartonella henselae**

Bartonella koehlerae

Bartonella quintana

Bartonella rochalimae

Bartonella vinsonii subsp.

*berkhoffii**

Bartonella washoensis

Bergeyella zoohelcum^C

*Bordetella bronchiseptica**

Bordetella pertussis

Borrelia burgdorferi sensu

*stricto**

Borrelia afzelii sensu lato

Borrelia garinii sensu lato

Borrelia turicatae

Brachyspira alvinipulli-like

Brachyspira canis

Brachyspira intermedia

Brachyspira pilosicoli^C

Brachyspira pulli

Brevibacterium spp.^C

Brucella abortus

*Brucella canis**

Brucella suis

Burkholderia mallei

Burkholderia pseudomallei[❖]

*Campylobacter coli**

Campylobacter gracilis

Campylobacter helveticus

*Campylobacter jejuni**

Campylobacter lari

*Campylobacter upsaliensis**

Candidatus Mycoplasma

haematoparvum

*Capnocytophaga canimorsus**

Capnocytophaga cynodegmi^C

Chlamydia abortus

Chlamydia caviae

Chlamydia felis

Chlamydia psittaci

Chromobacterium spp.^{❖D}

Chromobacterium violaceum[❖]

Citrobacter diversus

Citrobacter freundii^C

Citrobacter spp.^D

Clostridium botulinum type C

Clostridium botulinum type D

*Clostridium difficile**

*Clostridium perfringens**

Clostridium piliforme

Clostridium spp.^C

Clostridium tetani^C

Corynebacterium auriscanis^D

Corynebacterium canis^C

Corynebacterium freiburgense^C

Corynebacterium spp.^D

Corynebacterium ulcerans^C

Corynebacterium urealyticum

*Coxiella burnetii**

Cytobacillus firmus^C

Dermabacter hominis^C

Dermatophilus congolensis

Eikenella corrodens^C

Enterobacter cloacae^C

Enterococcus avium^C

Enterococcus canintestini

Enterococcus casseliflavus

Enterococcus faecalis^C

*Enterococcus faecium**

Enterococcus gallinarum

Enterococcus hirae

Enterococcus malodoratus^D

*Enterococcus spp.**

Erysipelothrix rhusiopathiae^C

Erysipelothrix tonsillarum

serovar 7

Escherichia coli (EHEC, EPEC,

AIEC, UPEC, NTEC,

*ETEC)**

Eubacterium plautii^D

Eubacterium spp.^C

Flavobacterium spp.^D

Francisella philomiragia

*Francisella tularensis**

*Fusobacterium spp.**

Gemella morbillorum^C

Haemophilus aphrophilus^C

Helicobacter bilis

Helicobacter bizzozeronii

Helicobacter canis^D

Helicobacter cinaedi

Helicobacter cynogastricus

Helicobacter felis^D

Helicobacter fennelliae

*Helicobacter heilmannii**

Helicobacter rappini

Helicobacter salomonis

*Klebsiella spp.**

Lactobacillus spp.^C

Lawsonia intracellularis

Leptospira interrogans serovar

australis^C

Leptospira interrogans serovar

*autumnalis**

Leptospira interrogans serovar

bataviae^D

Leptospira interrogans serovar

*bratislava**

Leptospira interrogans serovar

*canicola**

Only a portion of the information obtained in this study is presented here. Please contact the authors for additional reference material on why a pathogen was or was not included in a particular step.

Leptospira interrogans serovar grippityphosa*
Leptospira interrogans serovar hardjo*
Leptospira interrogans serovar icterohaemorrhagiae*
Leptospira interrogans serovar pomona*
Leptospira interrogans serovar zanoni^D
Leptotrichia buccalis^C
Listeria monocytogenes
Mesomycoplasma molare
Metamycoplasma gateae
Metamycoplasma spumans
Methicillin resistant
 CoNS strains (MRSS)
Methicillin resistant
 Staph aureus (MRSA)*
Methicillin resistant
 Staph pseudintermedius (MRSP)*
Micrococcus lylae^D
Micrococcus spp.^C
Moraxella spp.*
Mycobacterium avium subsp paratuberculosis❖
Mycobacterium avium-intracellulare complex❖
Mycobacterium bovis
Mycobacterium chelonae-abscessus group^C
Mycobacterium fortuitum group^C
Mycobacterium genavense❖
Mycobacterium goodii❖
Mycobacterium kansasii^C
Mycobacterium microti
Mycobacterium smegmatis group❖
Mycobacterium Canine Leproid Granulomas
Mycobacterium tuberculosis
Mycoplasma arginini
Mycoplasma bovigenitalium
Mycoplasma canis
Mycoplasma cynos
Mycoplasma edwardii^C
Mycoplasma feliminutum
Mycoplasma felis
Mycoplasma haemocanis
Mycoplasma maculosum
Mycoplasma opalescens
Mycoplasma ovis
Neisseria animaloris^C
Neisseria canis^C
Neisseria dentiae^D
Neisseria spp.^C
Neisseria weaveri*

Neisseria zoodegmatis^C
Nocardia brasiliensis^C
Nocardia farcinica^C
Nocardia nova^C
Nocardia otitidiscaviarum^C
Oerskovia spp.^D
Pasteurella canis*
Pasteurella multocida*
Pasteurella spp.*
Pediococcus spp.^D
Peptostreptococcus spp.^C
Plesiomonas shigelloides^C
Porphyromonas spp.^D
Prevotella spp.^C
Propionibacterium spp.^C
Proteus mirabilis^C
Proteus vulgaris^C
Providencia alcalifaciens
Providencia stuartii
Pseudomonas aeruginosa*
Pseudomonas oryzihabitans^D
Pseudomonas spp.^C
Ralstonia pickettii❖
Rhodococcus equi
Riemerella anatipestifer^C
Salmonella enterica (enteritidis, typhimurium)*
Serratia spp.
Shigella spp.
Staphylococcus aureus*
Staphylococcus epidermidis^C
Staphylococcus pseudintermedius*
Staphylococcus schleiferi coagulans
Staphylococcus schleiferi schleiferi
Staphylococcus sciuri
Staphylococcus spp.^D
Staphylococcus xylosum^C
Stenotrophomonas maltophilia^C
Stomatococcus mucilaginosus^C
Streptobacillus moniliformis^C
Streptococcus agalactiae
Streptococcus canis (Group G)*
Streptococcus dysgalactiae dysgalactiae
Streptococcus dysgalactiae equisimilis
Streptococcus equi subsp. equi
Streptococcus equi subsp. zooepidemicus^C
Streptococcus Group D commensals
Streptococcus Group E
Streptococcus Group L
Streptococcus Group M
Streptococcus intermedius

Streptococcus mitis (α - streptococcus)^C
Streptococcus pneumoniae
Streptococcus pyogenes (α - streptococcus)^C
Streptococcus spp.*
Streptococcus suis
Tannerella forsythia^D
Ureaplasma canigenitalium
Veillonella spp.^C
Wolbachia pipientis^D
Yersinia enterocolitica*
Yersinia pestis*
Yersinia pseudotuberculosis^C

Ectoparasites

Cheyletiella parasitovorax^D
Cheyletiella yasguri*
Ctenocephalides canis*
Ctenocephalides felis*
Demodex canis
Echinophaga gallinacea^C
Notoedres cati
Otodectes cynotis
Pneumonyssoides caninum
Pulex irritans*
Pulex simulans
Sarcoptes scabiei var canis*
Tunga penetrans
Xenopsylla cheopis^C

Fungi

Absidia spp.❖
Acremonium hyalinulum❖
Acremonium kiliense❖
Alternaria spp.❖
Aspergillus deflectus❖
Aspergillus flavipes❖
Aspergillus flavus❖
Aspergillus fumigatus❖
Aspergillus nidulans❖
Aspergillus niger❖
Aspergillus terreus❖
Basidiobolus spp.❖
Bipolaris spp.❖
Blastomyces dermatitidis*
Candida albicans
Candida famata
Candida glabrata
Candida guilliermondii
Candida krusei
Candida parapsilosis
Candida rugosa
Candida tropicalis
Chlorella spp.❖
Chrysosporium spp.❖

Cladophialophora bantiana ❖
Cladophialophora spp. ❖
Cladosporium xylohypha ❖
Coccidioides immitis
Coccidioides posadasii
Conidiobolus spp. ❖
Cryptococcus albidus ❖
Cryptococcus gattii ❖*
Cryptococcus laurentii ❖
Cryptococcus neoformans ❖
Curvularia spp. ❖
Emmonsia parva ❖
Encephalitozoon cuniculi
Encephalitozoon hellem
Encephalitozoon intestinalis
Enterocytozoon bieneusi
Epidermophyton spp.
Fonsecaea spp. ❖
Fusarium spp. ❖
Geomyces spp. ❖
Geosmithia argillacea ❖
Geotrichum candidum ❖
Histoplasma capsulatum ❖*
Lagenidium spp. ❖
Madurella spp. ❖
*Malassezia pachydermatis**
*Microsporium canis**
Microsporium gypseum
Monocillium indicum ❖
Mucor spp. ❖
Ochroconis spp. ❖
Paecilomyces fumosoroseus ❖
Paecilomyces lilacinus ❖^C
Paecilomyces variotii ❖
Paracoccidioides brasiliensis ❖
Penicillium spp. ❖
Phialemonium spp. ❖
Phialophora spp. ❖
Pneumocystis carinii ❖
Pneumocystis wakefieldae ❖
Prototheca spp. ❖
Pseudallescheria boydii ❖
Pseudomicrodochium spp. ❖
Pythium insidiosum ❖
Rhinosporidium seeberi ❖
Rhizomucor spp. ❖
Rhizopus spp. ❖
Rhodotorula glutinis ❖
Rhodotorula mucilaginosa ❖
Saksenaia spp. ❖
Schizophyllum commune ❖
*Sporothrix schenckii**
Trichoderma spp. ❖
Trichosporon cutaneum ❖
Trichophyton spp.*

Helminths

Acanthocheilonema
*reconditum**
*Alaria alata**
*Alaria americana**
*Alaria canis**
*Alaria marcianae**
Alaria nasuae
Amphimerus pseudofelineus^D
Ancylostoma braziliense
Ancylostoma caninum
Ancylostoma ceylanicum
Angiostrongylus vasorum
*Apophallus donicus**
Ascaris lumbricoides
*Baylisascaris procyonis**
Brugia malayi
Brugia pahangi
Capillaria aerophila
Centrocestus armatus
Centrocestus formosanus
Clonorchis sinensis
*Cryptocotyle lingua**
Dicrocoelium dendriticum
Diocotophya renale
Diphyllobothrium spp.*
*Dipylidium caninum**
*Dirofilaria immitis**
Dirofilaria repens^D
Dracunculus insignis
Dracunculus medinensis
Echinochasmus fujianensis
Echinochasmus japonicus
Echinochasmus liliputanus
Echinochasmus perfoliatus
*Echinococcus granulosus**
*Echinococcus multilocularis**
Echinococcus vogeli^D
Echinostoma cinetorchus
Echinostoma hortense
Echinostoma ilocanum
Echinostoma spp.
Episthmium caninum
Filaroides hirthei
Gnathostoma spinigerum
Haplorchis pumilio
Haplorchis taichui
Haplorchis yokogawai
Heterobilharzia americana
Heterophyes dispar
Heterophyes heterophyes
Heterophyopsis continua
Macracanthorhynchus
hirudinaceus^D
Macracanthorhynchus ingens^C
Mesocestoides spp.*
Metagonimus yokogawai
Metorchis albidus
*Metorchis conjunctus**

*Nanophyetus salmincola**
Ollulanus tricuspis
Onchocerca lupi
Oncicola canis
Opisthorchis felineus
Opisthorchis neverca
Opisthorchis viverrini
Oslerus osleri
Paragonimus africanus
Paragonimus heterotremus
Paragonimus hueit'ungensis
*Paragonimus kellicotti**
Paragonimus mexicanus
Paragonimus spp.
Paragonimus westermani
Phagicola longa^C
Phaneropsolus bonnei
Physaloptera rara
Plagiorchis muris
Prohemistomum vivax
Prosthodendrium glandulosum
Prosthodendrium obtusum
Pseudamphistomum truncatum
Pygidiopsis summa
Schistosoma incognitum
Schistosoma japonicum
Schistosoma mansoni
Schistosoma mekongi
Schistosoma rodhaini
Spirocerca lupi
Spirometra mansonii
Stellantchasmus falcatus
Stellantchasmus pseudocirratu
Stictodora fuscata
Strongyloides stercoralis^C
Taenia brauni^D
Taenia crassiceps
Taenia hydatigena
Taenia krabbei
Taenia multiceps^C
Taenia ovis
Taenia pisiformis
*Taenia serialis**
Taenia solium
Taenia spp.*
Taenia taeniaeformis
Thelazia californiensis^D
Thelazia callipaeda^D
Toxascaris leonina
*Toxocara canis**
Trichinella spiralis
Trichuris vulpis
*Uncinaria stenocephala**

Protozoa

Acanthamoeba castellanii ❖
Acanthamoeba culbertsoni ❖

***Acanthamoeba* genotype T1** ❖

Babesia caballi

Babesia canis canis

Babesia canis rossi

Babesia canis vogeli

Babesia conradae

Babesia gibsoni

Babesia microti-like (*Babesia annae*)

Balamuthia mandrillaris ❖^c

Balantidium coli^c

Blastocystis hominis

***Blastocystis* spp.**

Caryospora bigentica-like

Cryptosporidium canis*

Cryptosporidium muris

Cryptosporidium parvum

Cyclospora cayetanensis

Entamoeba histolytica

Giardia duodenalis

(**assemblage A1**)*

Giardia duodenalis

(**assemblage B**)*

***Giardia duodenalis* assemblage C**

Giardia duodenalis assemblage D

Hammondia heydorni

Hepatozoon americanum

Hepatozoon canis

Intrahepatic biliary coccidiosis

Intrapulmonary coccidiosis

Isospora burrowsi

Isospora canis

Isospora neorivolta

Isospora ohioensis

Leishmania amazonensis

Leishmania braziliensis

Leishmania donovani

Leishmania infantum*

Leishmania major

Leishmania panamensis

Leishmania peruviana

Leishmania tropica

Neospora caninum

Pentatrichomonas hominis

Sarcocystis aucheniae

Sarcocystis canis

Sarcocystis capracanis

Sarcocystis cruzi

Sarcocystis fayeri

Sarcocystis hircicanis

Sarcocystis meischeriana

Sarcocystis neurona

Theileria annulata

Theileria equi

Toxoplasma gondii

Tritrichomonas foetus

Trypanosoma brucei

Trypanosoma brucei gambiense

Trypanosoma brucei rhodesiense

Trypanosoma caninum

Trypanosoma congolense

Trypanosoma cruzi^c

Trypanosoma evansi

Rickettsia

Anaplasma phagocytophilum*

Anaplasma platys

Ehrlichia canis*

Ehrlichia chaffeensis

Ehrlichia ewingii

Ehrlichia ruminantium

Neorickettsia elokominica

Neorickettsia helminthoeca

Neorickettsia risticii

Neorickettsia risticii subsp.
atypicalis

Orientia tsutsugamushi

Rickettsia akari

Rickettsia australis

Rickettsia conorii* subsp. *conorii

Rickettsia felis^c

Rickettsia japonica

Rickettsia prowazekii

Rickettsia rickettsii*

Stellanchasmus falcatus

Viruses

African Horse Sickness

Astrovirus

Australian bat virus

Barmah Forest virus

Bluetongue virus

Borna Disease virus

Canine Acidophil Cell Hepatitis

Canine Adenovirus 1

Canine Adenovirus 2

Canine Calicivirus (strain 48)

Canine Coronavirus

group 1 type 1

Canine Coronavirus

group 1 type 2 (pantropic
biotype)

Canine Coronavirus

group 1 type 2 (subtype a
and b)

Canine respiratory coronavirus

group 2 (subtype a)

Canine Distemper virus

Canine Herpesvirus 1

Canine Influenza virus (H3N8)

Canine Norovirus

Canine Oral Papillomavirus

Canine Papillomavirus type 2

Canine Papillomavirus type 3

Canine Papillomavirus type 6

Canine Papillomavirus type 7

Canine Parainfluenza virus
(respiratory)

Canine Parainfluenza virus 5
variant (non-respiratory)

Canine Parvovirus 1

Canine Parvovirus 2

Canine Pneumovirus

Canine rotavirus group A
(**G3P[3], G3P[8]**)^D

Cowpox

Coxsackievirus A9, A20

Coxsackievirus B1

Coxsackievirus B3

Coxsackievirus B5

Eastern equine encephalitis

Ebola virus

Echovirus 6

Echovirus 7

Encephalomyocarditis virus

European bat virus

Foot and Mouth Disease

Hendra virus

Hepatitis E virus

Influenza virus A (Human;
subtypes **H1N1, H3N2,**
H5N1)

Influenza virus B (Human)

Influenza virus C (Human)

Irkut virus

Japanese encephalitis virus

Kobuvirus

La Crosse virus

Lagos bat virus

Louping ill

Lymphocytic Choriomeningitis
virus

Mokola virus

Mumps virus

Nipah virus

Poliovirus 1

Porcine Herpesvirus 1

Powassan virus

Rabies (genotype 1 phylogroup 1
sub**type 1)***

Reovirus MRV (Mammalian

Reovirus) serotype 1

Reovirus MRV (Mammalian

Reovirus) serotype 2

Reovirus MRV (Mammalian

Reovirus) serotype 3

Rift Valley Fever

Ross River virus

Sapovirus

Sars-CoV-2 (Covid-19)

Sin Nombre virus

St. Louis encephalitis

Tenshaw (Tensaw) virus infection

<u>Tick borne encephalitis</u>	Vesicular exanthema
<u>Unclassified enteroviruses</u>	<i>West Nile virus</i>
<u>Venezuelan equine encephalitis</u>	Western equine encephalitis

Amendments (Jan 2022)

- 1) **California serogroup viruses:** amend by adding to initial list; amend as zoonotic/sapronotic/anthroponotic and a “Grey-Zone Pathogen” (dogs may serve as sentinels);
 - a. *Dogs (Canis familiaris) as sentinels for human infectious disease and application to Canadian populations: A systematic review*; Bowser et al., 2018
 - b. *Emerging arboviruses in Quebec, Canada: Assessing public health risk by serology in humans, horses and pet dogs*; Rocheleau et al., 2017
- 2) **Dengue fever:** amend by adding to initial list; amend as zoonotic/sapronotic/anthroponotic and involves dog in transmission/maintenance/detection, but not detected in Canada with unknown potential to occur in Canada;
 - a. *First evidence of dengue infection in domestic dogs living in different ecological settings in Thailand*; Thongyuan et al., 2017
- 3) **Mycobacterium tuberculosis*:** Already in list; amend to “Tier 1”
 - a. *Accidental infection of veterinary personnel with Mycobacterium tuberculosis at necropsy: A case study*; Posthau et al., 2011
- 4) **Ancylostoma caninum*:** already in list; amend to “Tier 1”
 - a. *Parasite prevalence in fecal samples from shelter dogs and cats across the Canadian provinces*; Villeneuve et al., 2015