

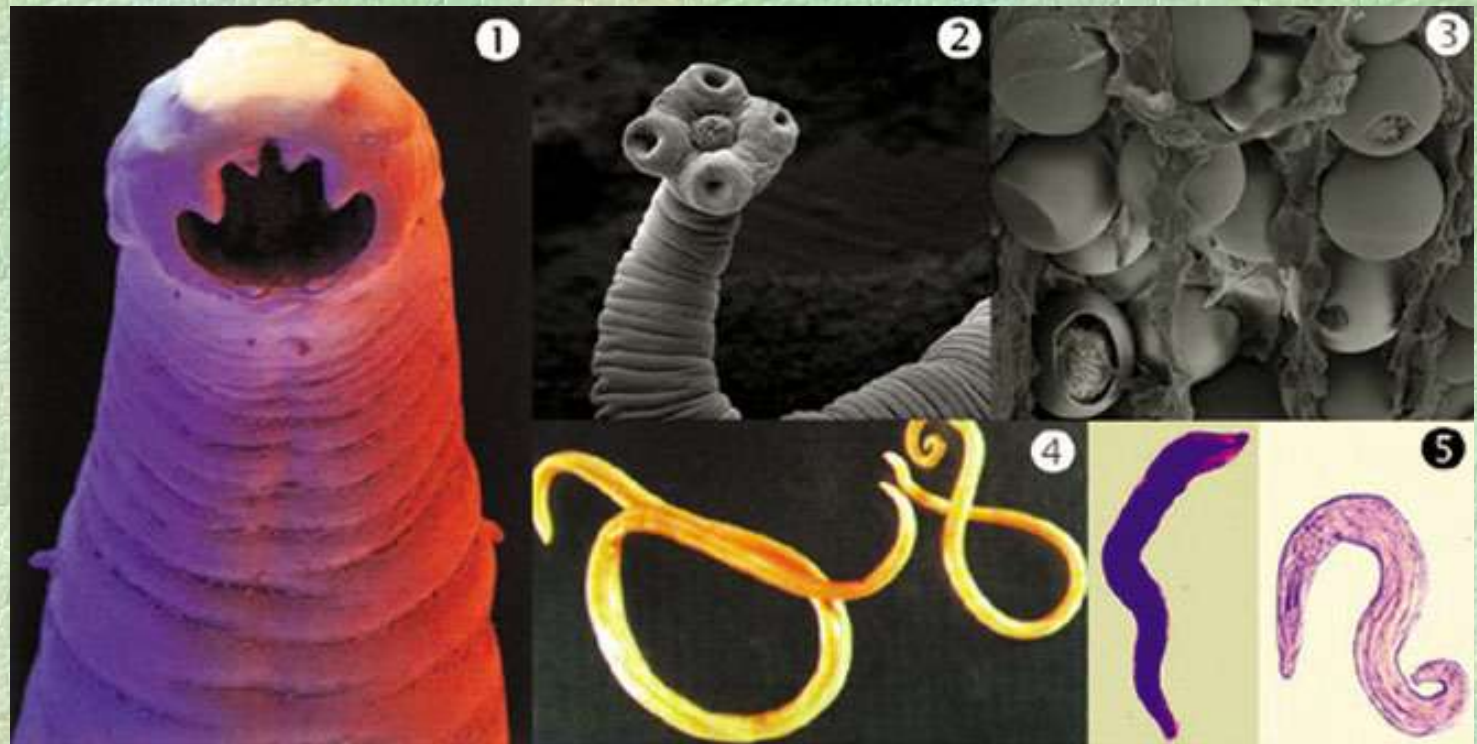


ZOONOSIS

What you don't know may hurt you.



ZOONOSIS



(1) The hookworm latches on the walls of the colon with its sharp teeth where it feeds on blood. (2) The tapeworm is the longest parasite. A mature adult can lay a million eggs a day. (3) Tapeworm eggs embedded in the colon. (4) The roundworm can grow to be 20 inches (50 cm) long and lay 200,000 eggs per day. (5) Pinworms migrate outside the colon during the night to lay their eggs around the anus. This causes the nightly itching of many unsuspecting victims.

SO MANY THINGS LURKING OUT THERE THAT THESE ANIMALS CAN PASS ON TO US



ZOONOSIS

- * Zoonoses Defined**
 - Importance to Wildlife Rehabilitators
- * Causative Agents:**
 - Bacteria, Viruses, Parasites & Fungi or Mycotic
- * Disease Prevention & Control**
 - Handwashing Techniques
- * Emerging Issues and Human Health Concerns:**
 - Increase in vector born illnesses
 - Microbial resistance
 - Biosecurity & Bioterrorism



ZOONOSIS

*Diseases that pass between animals and humans.....

Or

Eat Poop and Die!

* You should focus on:

How you can get

&

Ways to protect yourself from disease



ZOONOSIS

Disease Control & Prevention

Disease Transmission:

Directly from one vertebrate host to another via direct contact

Indirect transmission via intermediate host (vectors) ticks

Indirect transmission involving aerosol particles or fomites

Disease enters the body by 1 or more of 6 routes:

Inhalation

Inoculation-bite

Through mucosa

Ingestion

Through a break in the skin

Passing through the skin



ZOONOSIS

Causative Agents:

Bacteria (Bacterial Diseases)

Chlamydiosis/Psittacosis/Ornithosis, Leptospirosis, Lyme Disease, Rocky Mountain Spotted Fever, Salmonellosis, Tularemia, Ehrlichiosis

Viruses

California Encephalitis/La Crosse Encephalitis, Hantavirus Pulmonary Syndrome (HPS), Lymphocytic Choriomeningitis, Rabies, West Nile Disease, COVID-19

Parasites

Ascariasis, Babesiosis, Baylisascaris procyonis (raccoon roundworm), Cryptosporidiosis, Giardiasis, Toxoplasmosis, Toxocariasis (Visceral Larval Migrants), Trichinosis

Fungi/Mycoses

Aspergillosis, Cryptococcosis & Histoplasmosis, Ringworm



ZOONOSIS

Causative Agents

BACTERIA:

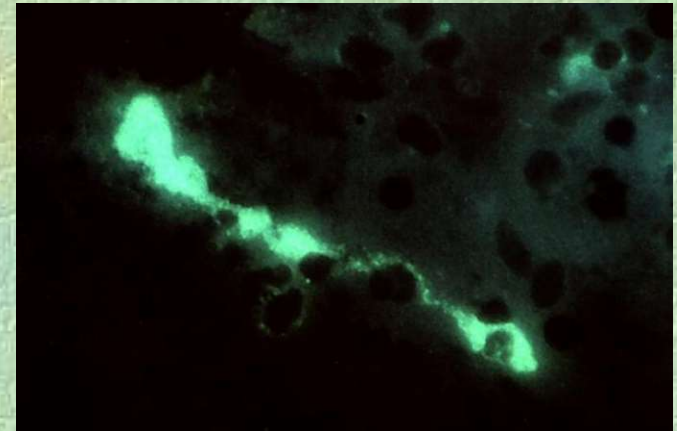
Chlamydiosis/Psittacosis/Ornithosis

- *chlamydia psittaci**

- *aerial transmission of dried secretions by pet birds, turkeys and ducks**

- *fever, chills, headache, muscle aches, dry cough**

- *can be difficult to diagnose**





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Causative Agents

Bacteria:

Leptospirosis

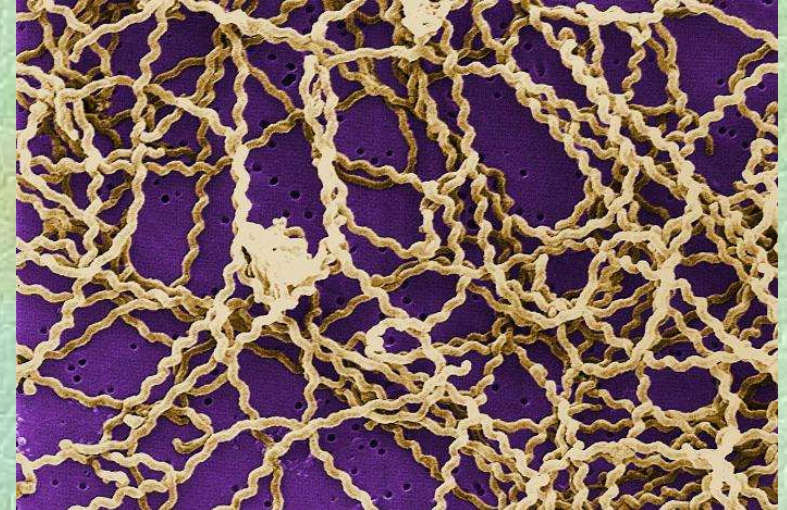
*leptospira

*exposure to urine contaminated water by cattle, pigs, horses, dogs, rodents and squirrels (rodents shed their entire lifetime w/o clinical signs)

*2 days to 4 weeks

*1st stage = fever, chills, headache, muscle aches, vomiting & diarrhea

*2nd stage = Weil's disease = kidney/liver failure or meningitis₈





ZOONOSIS

Causative Agents

Bacteria:

Ehrlichiosis

Causes disease in dogs, deer, coyotes and humans

1-2 wks after bite

Fever, chills, severe headache, muscle aches, nausea, vomiting/diarrhea, sometime rash

Treatment = Doxycycline

If not treated: seizures, coma, heart failure, sepsis, internal bleeding, renal failure, respiratory distress, brain inflammation



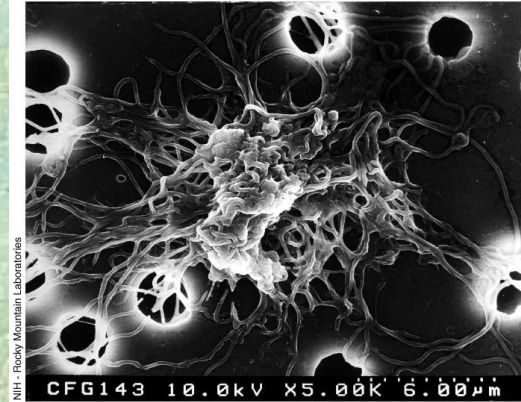
Lone Star Dog Tick



ZOONOSIS



Causative Agents:



Bacteria:

Lyme Disease

***borrelia burgdorferi**

***first characterized in US in 1976**

***white-footed mouse-fox, raccoon, opossum, deer - 3-host tick**

- 1st stage = rash at bite site, flu like symptoms
- 2nd stage = weeks to months later = cardiac & neurological abnormalities
- 3rd stage = months to years later = arthritis of large joints & chronic skin infections



ZOONOSIS

Causative Agents:

Bacteria:

Rocky Mountain Spotted Fever

***Rickettsia rickettsii**

***American Dog Tick and Rocky Mountain Wood Tick**

***White-footed mouse, fox, raccoon, opossum, deer - 3-host tick**

Flu-like symptoms including intense headache and fever and stiff neck within 3-14 days. Rash at the bite site or on wrists and ankles

Treatment = antibiotics

If left untreated symptoms get worse and cause organ damage and death



American Dog Tick



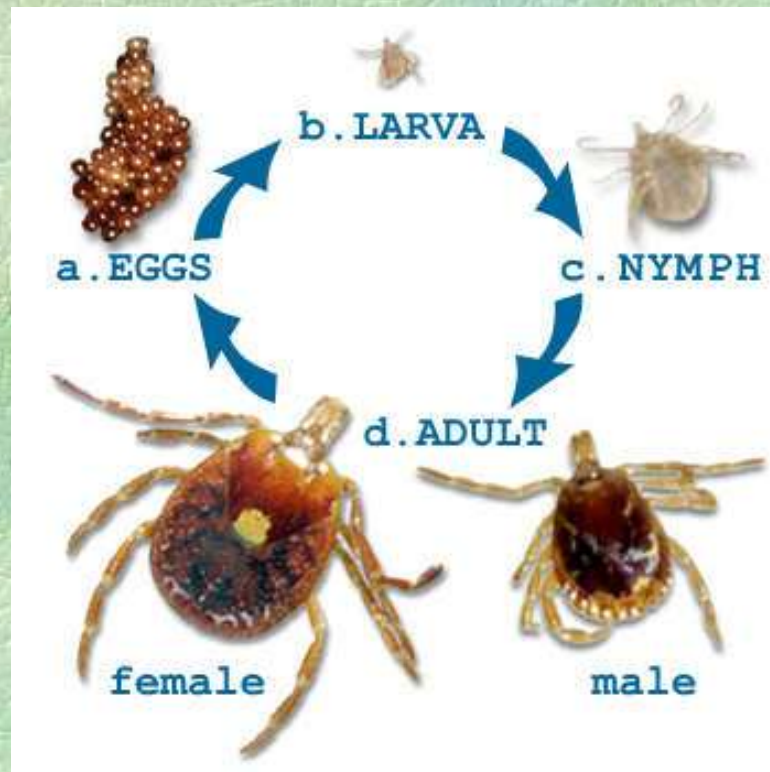
ZOONOSIS

Causative Agents:
Bacteria:

Rocky Mountain Spotted Fever

- *transmitted through saliva after several hours of attachment
- * ticks b/c infected in either larval, nymphal or adult stages

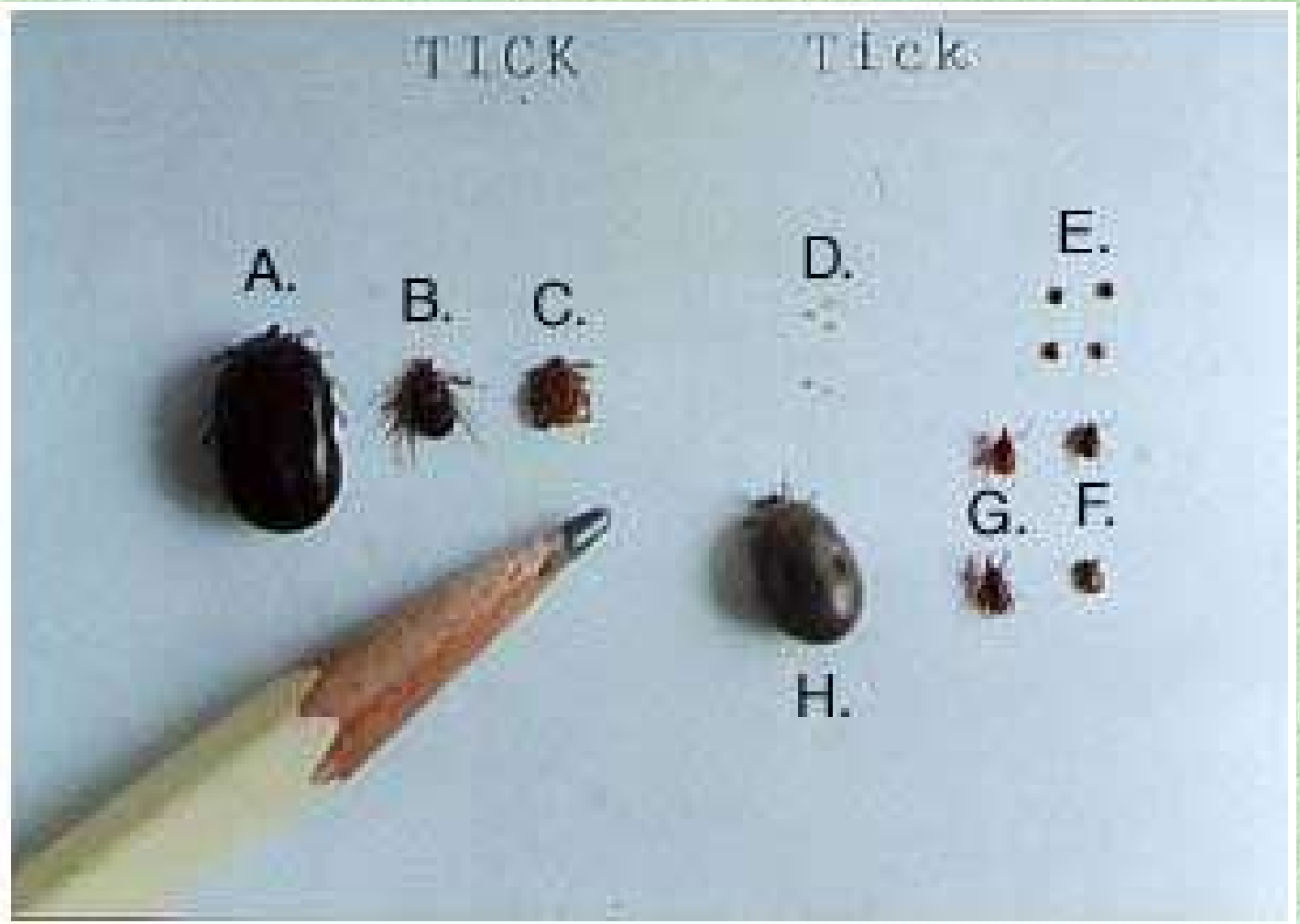
Texas Department of Health





ZOONOSIS

Vanderhoof-Forschner



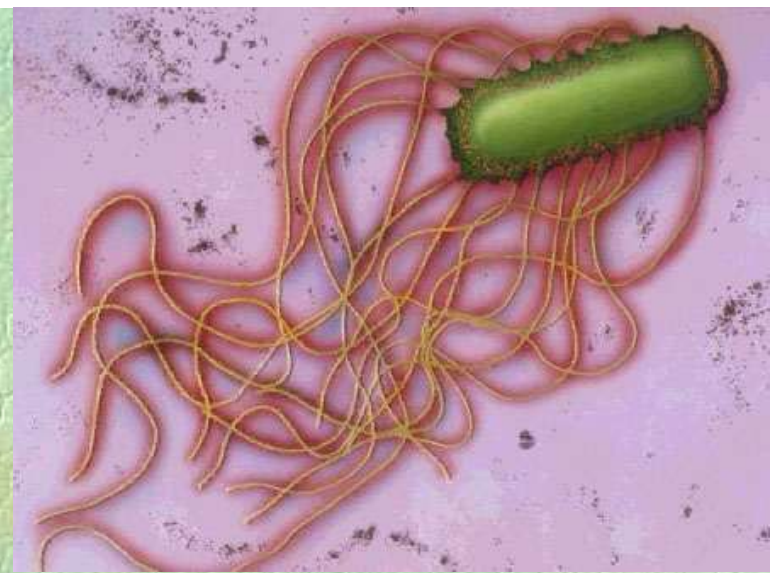
- A. Engorged female
- B. Female
- C. Male
- D. Larvae

- E. Nymphs
- F. Males
- G. Females
- H. Engorged female



ZOONOSIS

Causative Agents:



Bacteria:

Salmonella

- *Salmonella
- *Occurs in mammals, birds, & reptiles
- *One of the world's most widespread diseases
- *12 to 72 hours
- *Diarrhea, fever and abdominal cramps
- *Lasts 4 to 7 days and is usually self-limiting



ZOONOSIS

Causative Agents:

Bacteria:



Tularemia

- *Francisella tularensis**
- *Occurs in rodents, rabbits, & hares**
- *Transmission by infected tick, deerfly or insect**
- *Handling infected animal carcasses**
- *Eating/drinking infected food/water**
- *Inhaling the bacteria**
- *3 to 5 days but as long as 14 days**
- *Sudden fever, chills, headaches, diarrhea, muscle aches, joint pain, dry cough, progressive weakness, pneumonia chest pain, trouble breathing**
- *Consult your doctor at first sign of illness**



ZOONOSIS

Causative Agent:
Bacteria

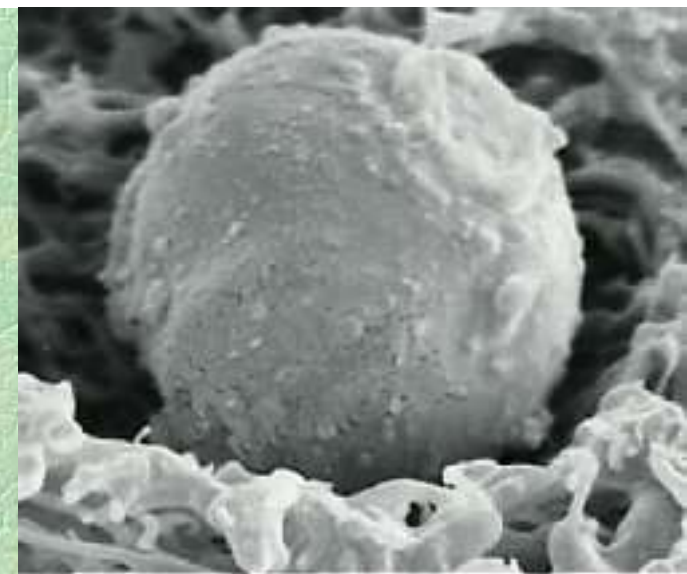
Cryptosporidiosis

Symptoms:

Dehydration
Weight loss
Stomach cramps or pain
Fever
Nausea
Vomiting

usually last about 1 to 2 weeks.

The symptoms may go in cycles in which you may seem to get better for a few days, then feel worse again before the illness ends



Cryptosporidium Oocyst



ZOONOSIS

Causative Agents:



Virus

La Crosse Encephalitis

- *chipmunks, squirrels, mosquitoes
- *survives the winter in the mosquito
- *5-15 days after bite
- *None to flu-like symptoms
- *Seizures, disorientation, coma & paralysis,
- *inflammation of the brain, CNS signs



ZOONOSIS

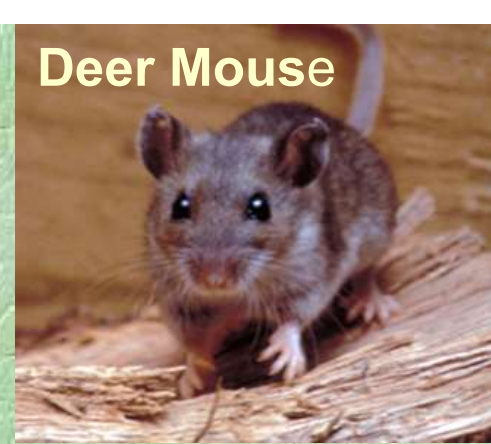
Causative Agents:

Virus

Hantavirus Pulmonary Syndrome (HPS)

- *deer mouse in SE
- *shed virus in urine, droppings and saliva = aerosolization
- *fever, deep muscle aches (thighs, hips & back) headache, chills, nausea, vomiting, diarrhea
- *rapidly progress into severe respiratory failure

Deer Mouse



Cotton Rat



Rice Rat





ZOONOSIS

Causative Agents:

Virus

Lymphocytic Choriomeningitis (LCMV)

- *Mice, rats, hamsters, guinea pigs
- *Shed virus in urine, droppings and saliva = aerosolization, break in skin, bite, organ transplant
- *Flu like symptoms for up to 2 weeks, meningitis, paralysis, coma





ZOONOSIS

Causative Agents:
Virus



Rabies:

- * All warm-blooded mammals can transmit the disease,
- * High rates of infection in Skunks, Raccoons and Foxes
- * Rare in Rodents, Lagamorphs, and Opossums



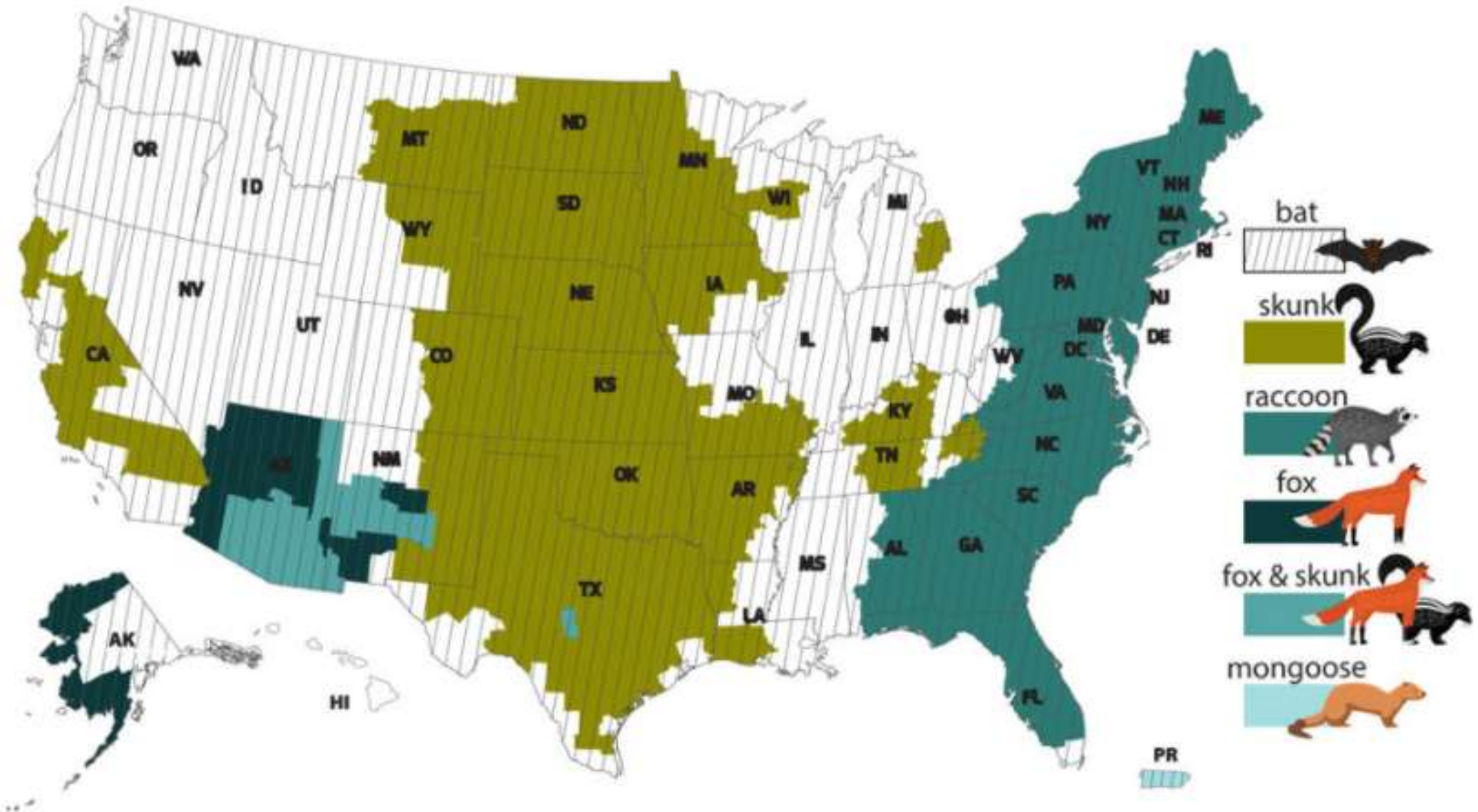
The best protection for you and the animal in your care is
to.....

AVOID BEING BITTEN, SCRATCHED
OR LICKED!!





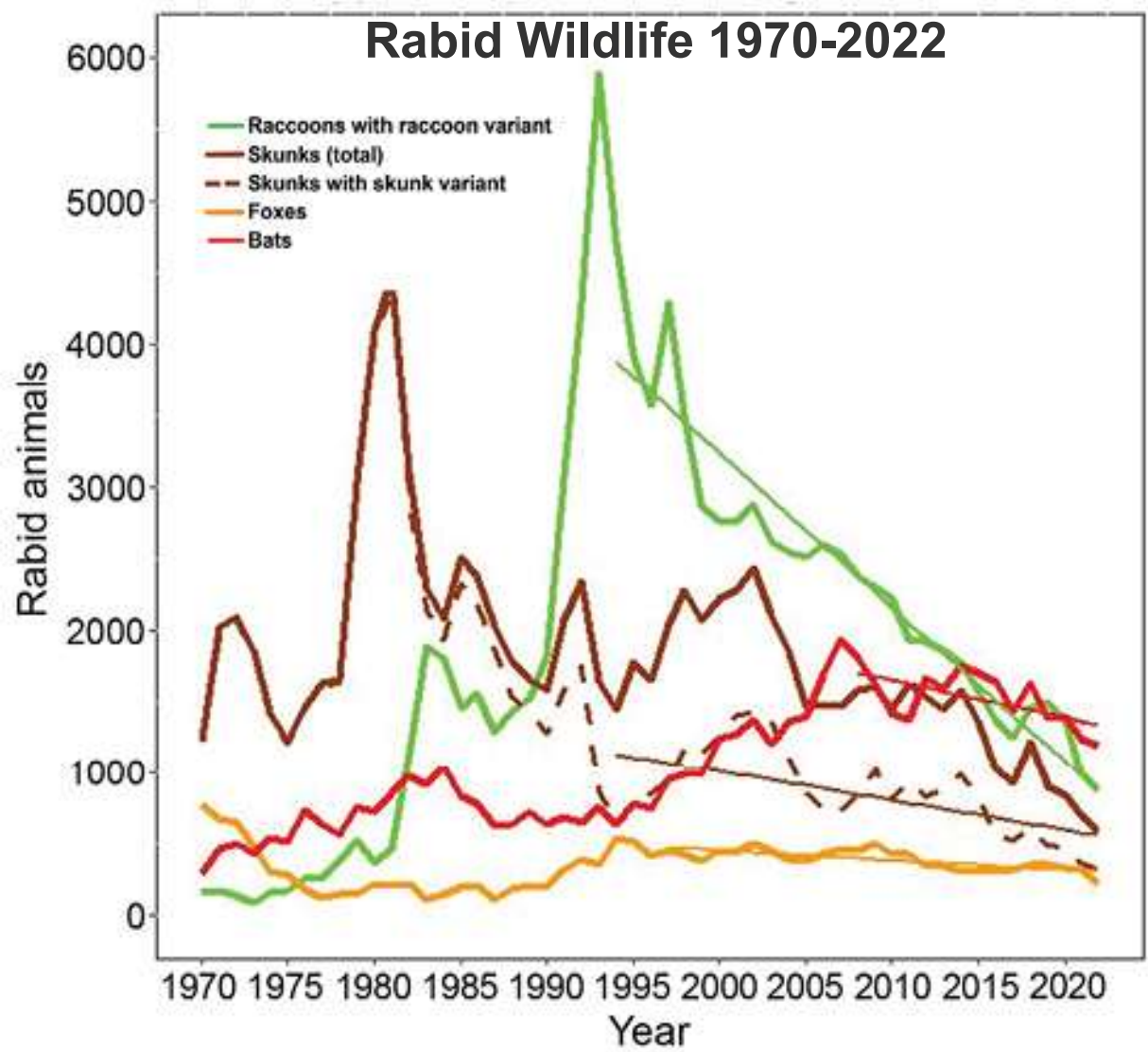
ZOOONOSIS





ZOONOSIS

Rabid Wildlife 1970-2022



Top States for Animal Rabies (2022 Data)

- **Texas:** 395 cases (highest).
- **Virginia:** 337 cases.
- **Pennsylvania:** 329 cases.
- **New York:** 267 cases.
- **North Carolina:** 264 cases.
- **California:** 241 cases.

 AVMA Journals



ZOONOSIS

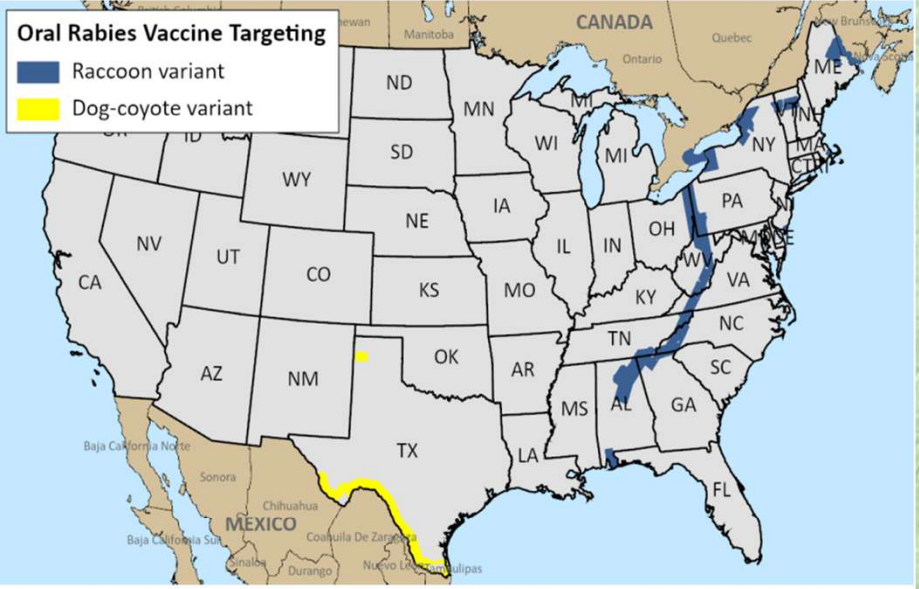


Figure 3. Distribution of oral rabies vaccine in North America targeting raccoon and dog-coyote rabies virus variants in 2022. Canada data used with permission from the Ontario Ministry of Natural Resources and Forestry and the New Brunswick Department of Agriculture, Aquaculture & Fisheries.



ORV Distribution by County for 2023 Abingdon

County	Fixed Wing V-RG CS	Ground V-RG FMP	Rotary Wing V-RG CS	Total
Ashe	1,309			1,309
Buncombe	37,008	5,400	39,034	81,442
Haywood	56,371		13,001	69,372
Henderson	6,251		841	7,092
Jackson	70,022			70,022
Macon	10,327			10,327
Madison	63,706		825	64,531
Mitchell	23,556			23,556
Swain	28,080			28,080
Transylvania	32,116			32,116
Yancey	40,751		1,799	42,550
Totals	369,497	5,400	55,500	430,397

ORV Distribution by County for 2023 Dalton

County	Fixed Wing V-RG CS	Total
Cherokee	65,735	65,735
Clay	28,974	28,974
Graham	10,261	10,261
Macon	59,503	59,503
Swain	10,073	10,073
Totals	174,546	174,546



ZOONOSIS

Causative Agents:

VIRUS

West Nile Virus

***Mosquito**

***3 to 14 days after being bitten**

***80% of people don't show symptoms**

***20% = fever, headache, body ache, nausea, swollen glands**



ZOONOSIS

Causative Agent:

PARASITES:

- * **Baylisascaris procyonis (raccoon roundworm)**
- * **Baylisascaris columnaris (skunk roundworm)**
- * **Babesiosis**
- * **Cryptosporidiosis**
- * **Ehrlichiosis**
- * **Giardiasis**
- * **Toxoplasmosis**
- * **Trichinosis**
- * **Toxocariasis (Visceral Larval Migrants)**



ZOONOSIS

Causative Agent:

PARASITES

Baylisascaris procyonis (raccoon roundworm)

- *millions of eggs produced in intestine and passed out in feces**
- *does not affect raccoon**
- *nausea, tiredness, liver enlargement, loss of coordination, lack of attention to people/surroundings, loss of muscle control coma, blindness**





ZOONOSIS

Causative Agents:



FUNGI OR MYCOSIS:

Aspergillosis – lung fungus from moldy hay also called farmer’s lung

Cryptococcosis – yeast like lung fungus that sometimes spreads to the brain

Histoplasmosis – fungus found in bird and bat droppings; not serious if confined to lungs but fatal if spread throughout body

Ringworm – also closely related to athlete’s foot or jock itch, caused by fungus



ZOONOSIS

Causative Agents:

PROTOZOAL DISEASE:

- *Giardiasis** - Most frequently diagnosed intestinal parasitic disease in the US
- *Toxoplasmosis** –
 - *Eating undercooked meat (pork, lamb, venison) or shell fish (oysters, clams or mussels)**
 - *rodents & birds droppings**



ZOONOSIS

Zoonoses

Disease Control & Prevention

Rationale: You can't provide good rehabilitative care if you are sick

Prevention of Disease Transmission:

- Good Handwashing**
- Good Cleaning protocols**
- Careful handling of animals**
- Proper disposal of fecal materials**
- Proper protective gear**
- Using your common sense**



ZOONOSIS

Emerging Issues & Human Health Concerns:

*Increased vector born illness

West Nile, tick-borne encephalitis

*Microbial resistance –

Overuse of antibiotics

Bacteria, viruses, fungi & parasites

no longer respond to medicines

*Biosecurity & Bioterrorism

The intentional use of micro-organism to bring about ill effects or death to humans, livestock or crops



ZOONOSIS

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Gibbons, Paul M., DVM, *Reptile Infectious Diseases: Transmission and Control*, NWRA Symposium, March 16, 2001

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IWRRC Conference Proceedings 1998 Basic Health and Safety for Wildlife Rehabilitators pg. 143-147.

IWRRC Conference Proceedings 1998 Zoonotic Diseases, What You Need to Know pg. 107-108.

Minimum Standards for Wildlife Rehabilitation IWRRC, NWRA, Third Edition 2000 Erica Miller DVM Editor.

Mitchell, Mark A., DVM, *Emerging Infectious Diseases in Reptiles and Amphibians*, NWRA Symposium, March, 2002.

Sleeman, Jonathan M. VetMB, MRCVS, & Clark, Edward, *The Role of Wildlife Centers in Wildlife Disease Monitoring*, NWRA Symposium, March 17, 2002.



ZOONOSIS

Zoonoses

Useful WEB Sites:

Emerging Infectious Diseases, CDC

<http://www.cdc.gov/ncidod/eid/vol4no3/murphy.htm>

Field Manual of Wildlife Diseases,

http://www.nwhc.usgs.gov/pub_metadata/field_manual/field_manual.html

Health Concerns to be Aware of When Working With Wildlife (a.k.a.-Zoonoses)
The Humane Society of the United States

www.tc.umn.edu/~devo0028/zoonos.htm

Melissa Kaplan's Herp Care Collection

<http://www.anapsid.org/mainzoonoses.html>

Overview of Zoonoses, LA Public Health, Veterinary Public Health

<http://www.lapublichealth.org/vet/guides/vetzooman.htm>

Parasitic Pathways, Division of Parasitic Disease, CDC

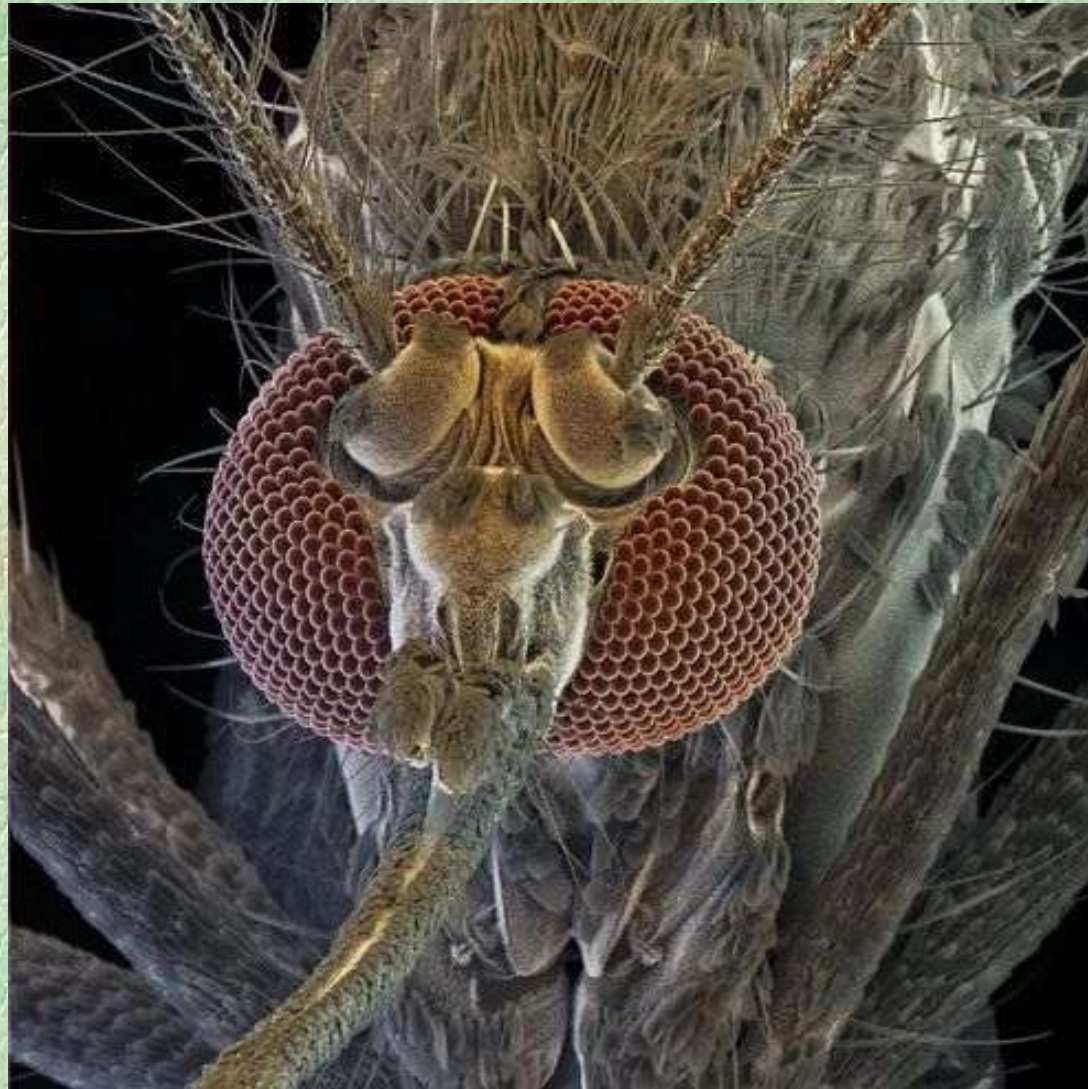
<http://www.cdc.gov/ncidod/dpd/parasiticpathways/animals.htm>

ZOONOSES or Everything I Didn't Want to Know About Wildlife Diseases

www.anglefire.com/nj/woundedknee/zoonoses.html

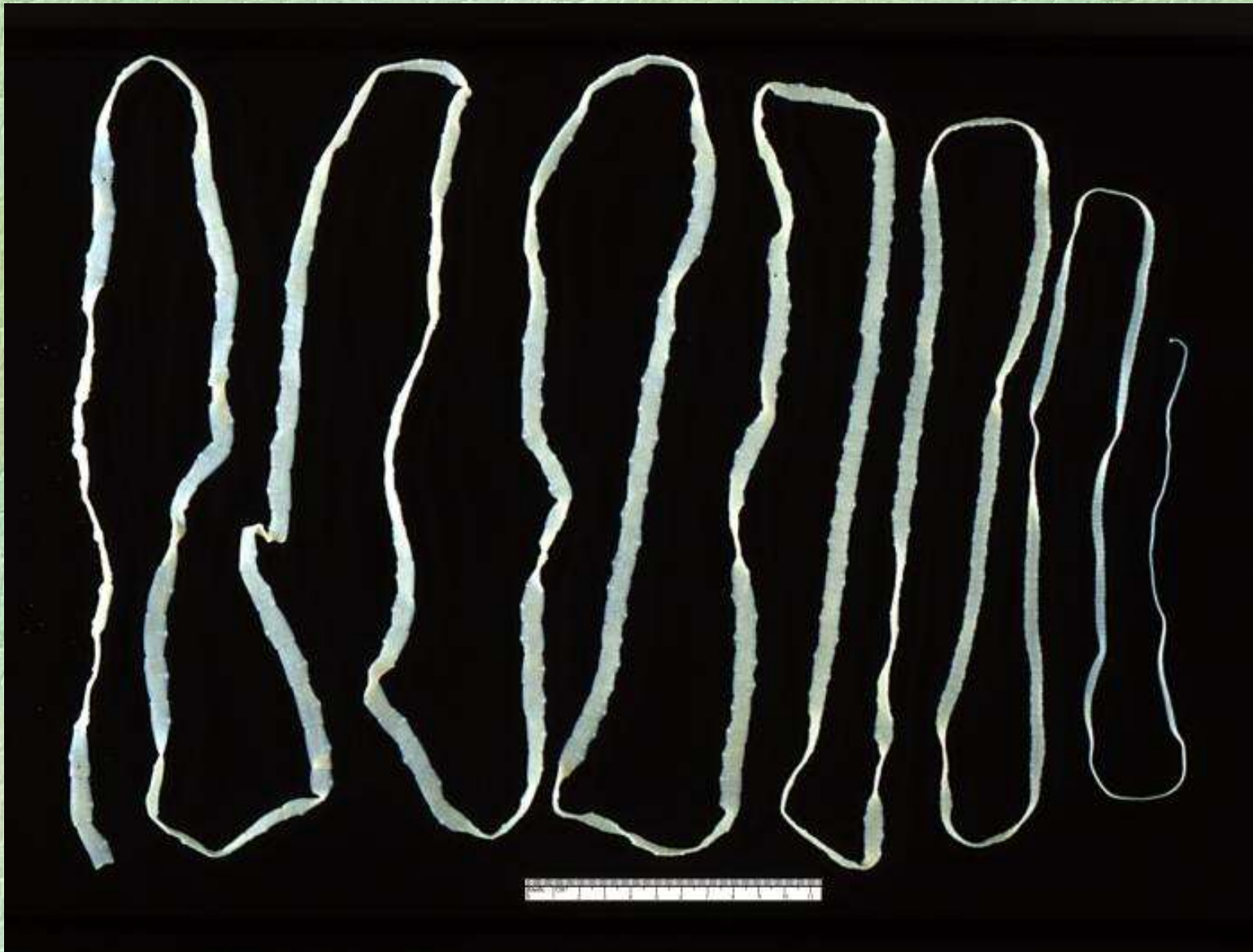


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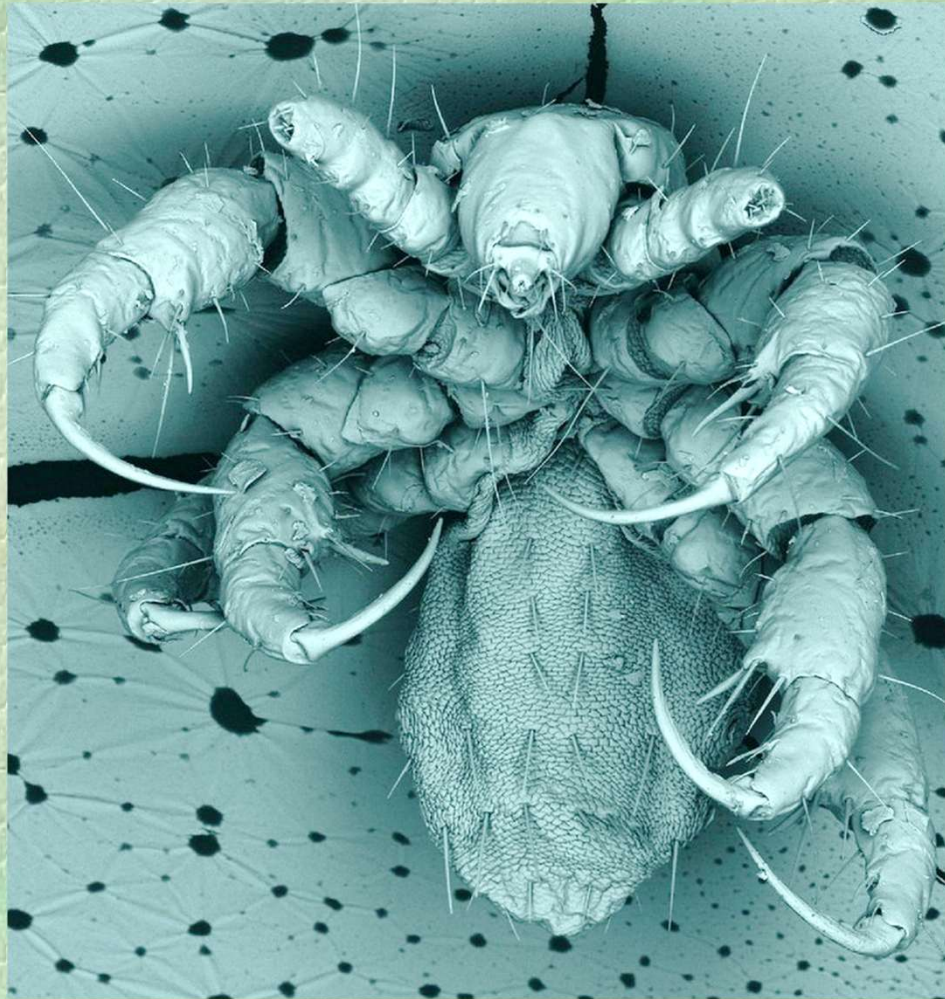


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