Ticks & The Diseases They Carry

By Eric C. Ratcliff

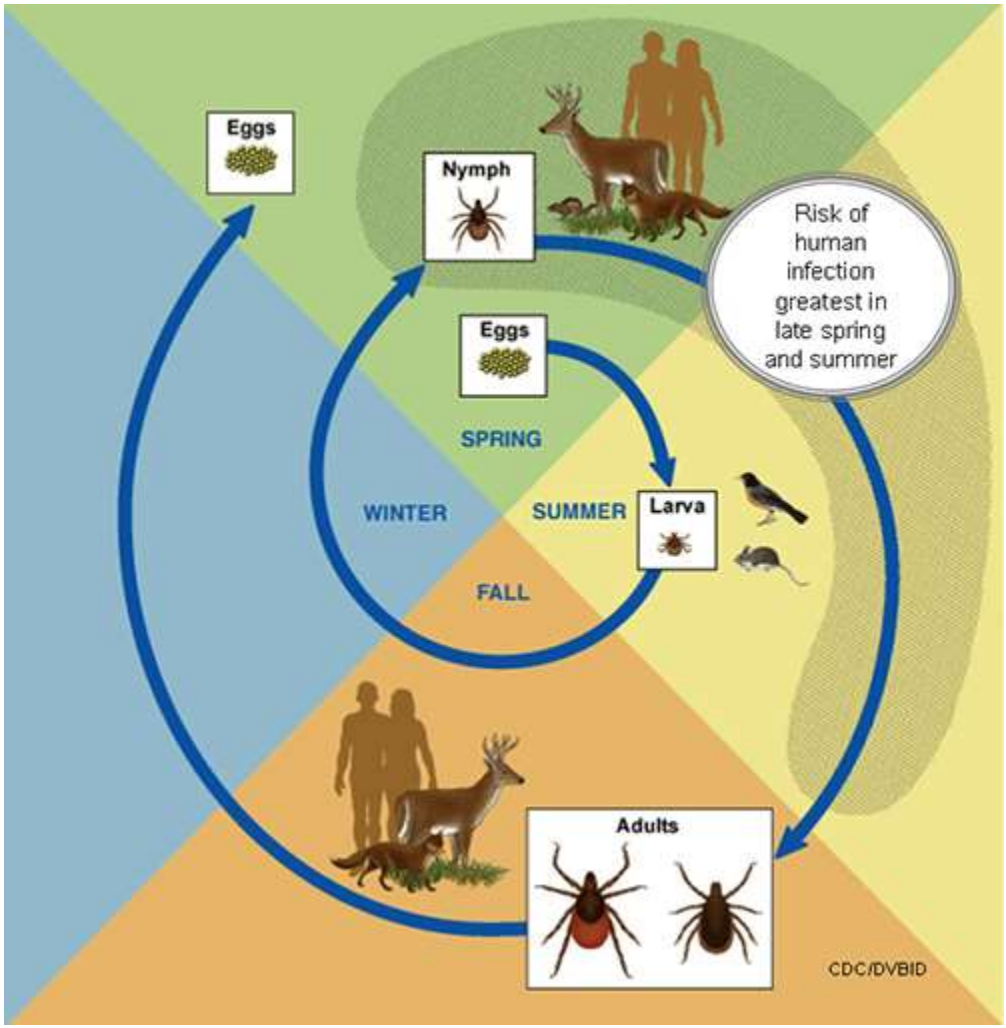
General Tick Biology

- Life cycle has 4 stages: egg, 6-legged larvae, 8-legged nymph, & adult
- Must consume blood from a host at every stage to develop – each stage must find a new host
- Pierces skin & attaches to host with mouthparts
- Feed on mammals, birds, & lizards
- Larvae & nymphs prefer smaller hosts

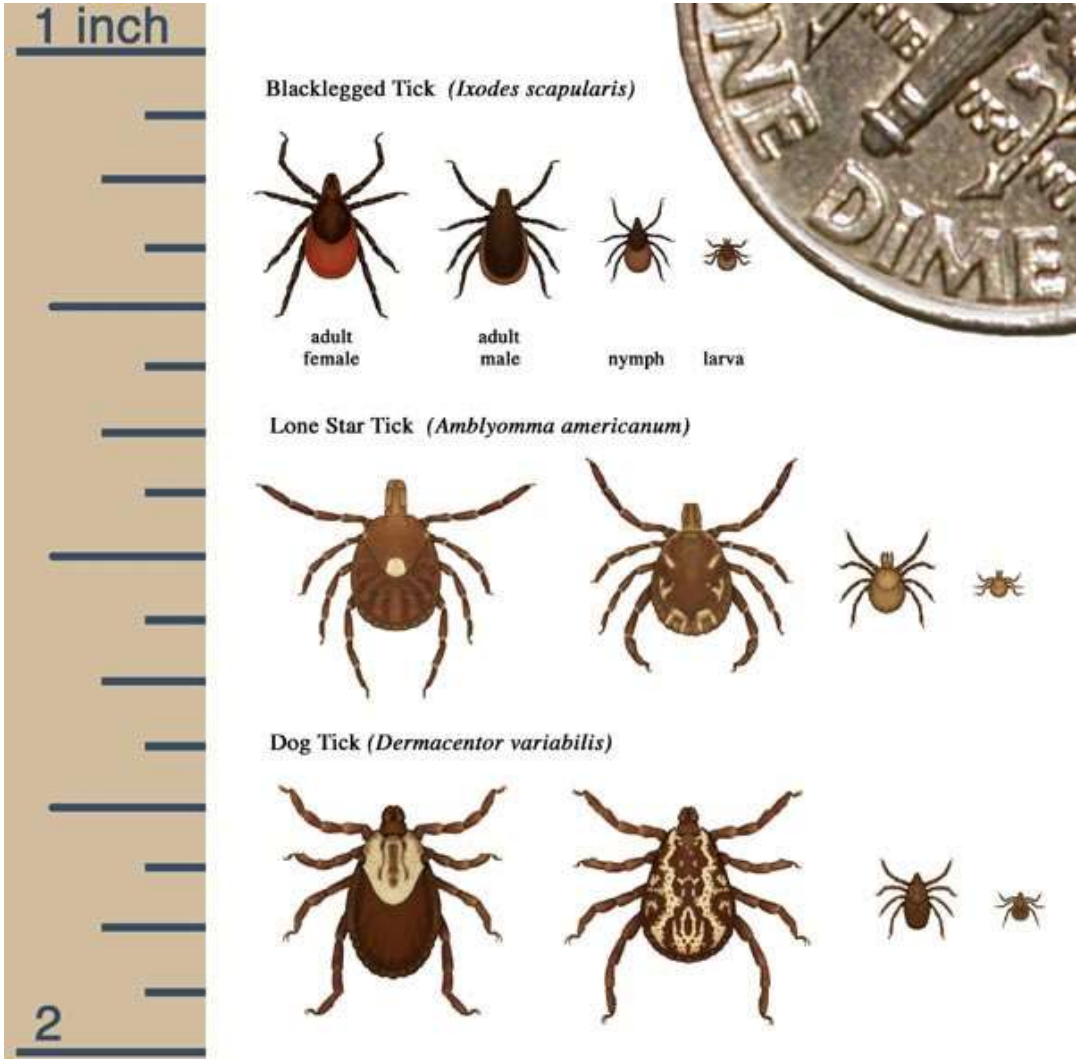
General Tick Biology

- Tick crawls upward on vegetation, waits with raised forelegs for host to pass by (questing behavior), & latches onto victim
- After feeding, female drops to ground, lays eggs (3,000 – 6,000), then dies
- Need moist shady habitats to breed – prefer high grass, brushy areas, & woodland
- Ticks live 1- 2 years depending on species & environmental conditions
- Not an insect – related to spiders & mites

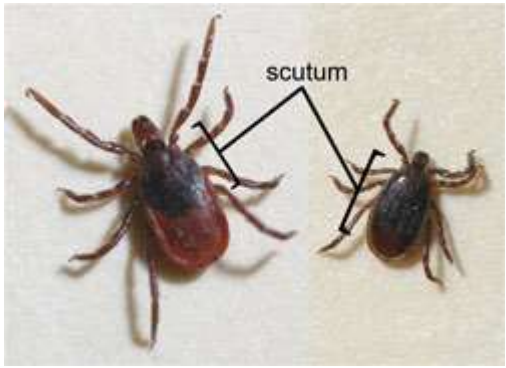
Tick Life Cycle



Tick Sizes

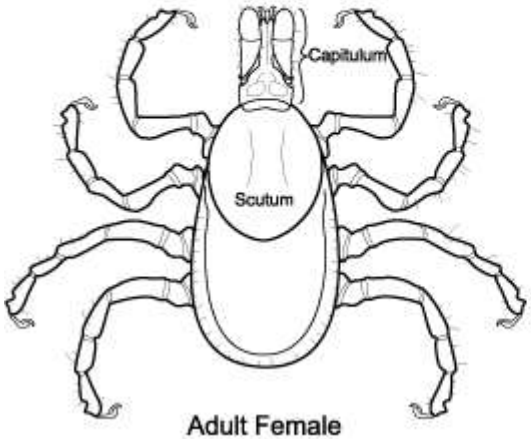

1 inch
2
Blacklegged Tick (Ixodes scapularis)
adult female
adult male
nymph
larva
Lone Star Tick (Amblyomma americanum)
Dog Tick (Dermacentor variabilis)

Tick Anatomy

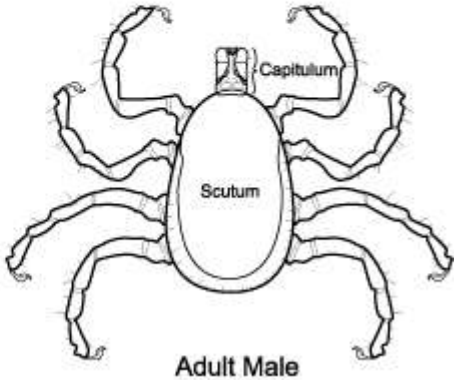


Ixodes scapularis
(Black-legged tick)

Note: Drawing is to scale
Actual Size:



Adult Female



Adult Male

Three Medically Important Ticks Species in Ohio

- American dog tick

- Blacklegged tick or deer tick

- Lone star tick

American Dog Tick: Male, Female, Larvae, Nymph

American Dog Tick: Identification

- Dog tick is largest tick in Ohio (~3/16")
- Adults are brownish with light grey mottling on scutum
- Female is ~5/8" after feeding & mostly grey

American Dog Tick: Biology

- Adults are active during spring & summer – most abundant mid-April to mid-July
- Most common tick species in Ohio
- Immatures rarely encountered
- Prefer grassy areas along roads & paths
- Tends to crawl upward to nape of neck to attach & feed

American Dog Tick: Diseases

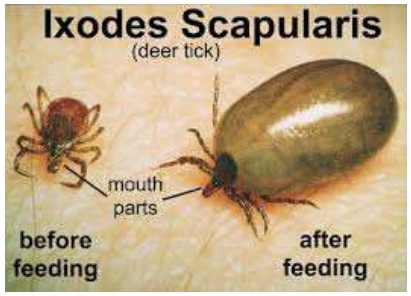
- Carries Rocky Mountain spotted fever
- Can also transmit tularemia
- Injected dog tick saliva can cause tick paralysis
- Infected tick attached to host 4 – 6 hours before transmitting disease

American Dog Tick - Distribution

Black-legged Tick: Male, Female, Larvae, Nymph

Blacklegged Tick or Deer Tick: Identification

- Smaller than other ticks - males 1/16", females ~3/32"
- Both sexes are dark chocolate brown, but rear half of adult female is red or orange
- Larval stage is nearly translucent
- Engorged adult females are brownish



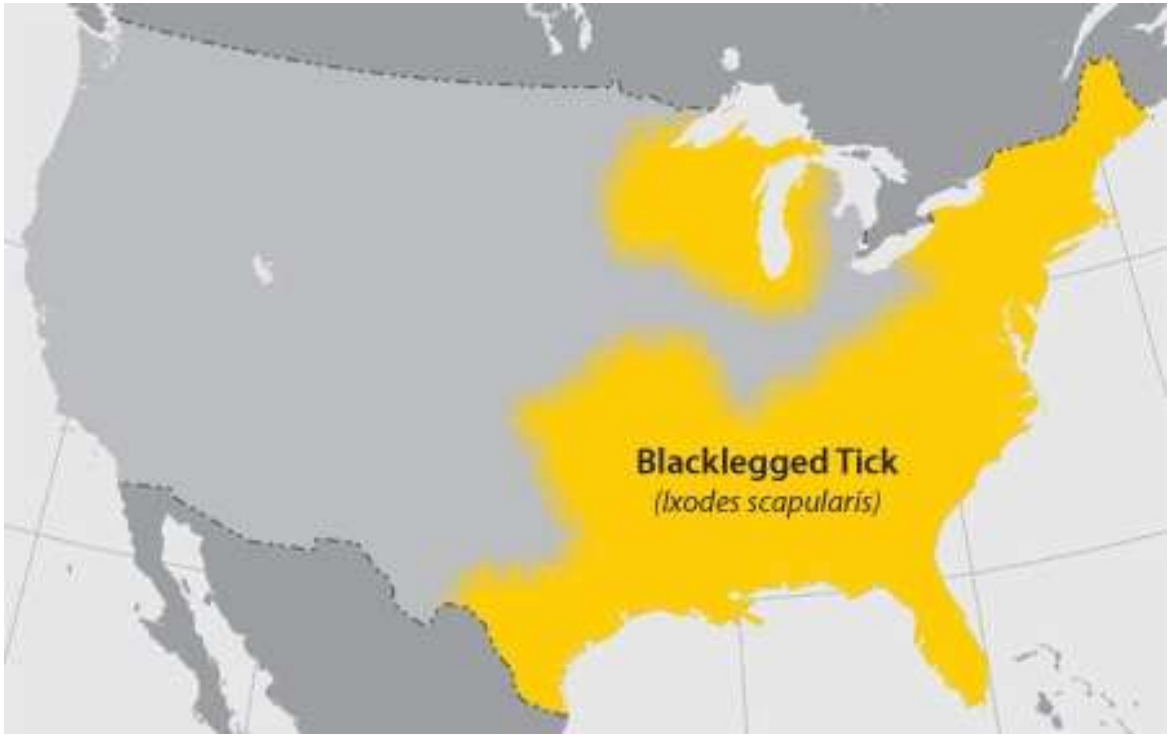
Blacklegged Tick or Deer Tick: Biology

- One or more stages may be found every month of the year
- Found mostly in, or near forested areas
- Adult ticks feed most commonly on white-tailed deer – all stages will feed on people
- No site attachment preference

Blacklegged Tick or Deer Tick: Diseases

- Carries Lyme disease
- May also carry anaplasmosis & ehrlichiosis
- Can infect a host with two or more diseases simultaneously
- Infected tick attached to host 36 – 48 hours before disease transmission

Blacklegged Tick – Distribution



Lone Star Tick: Male, Female, Larvae, Nymph

Lone Star Tick: Identification

- Adult female is ~3/16" long, brown with distinct silvery spot on upper scutum
- Male is ~3/16" long, brown with whitish markings along rear edge.
- Engorged female is almost circular & ~7/16" long

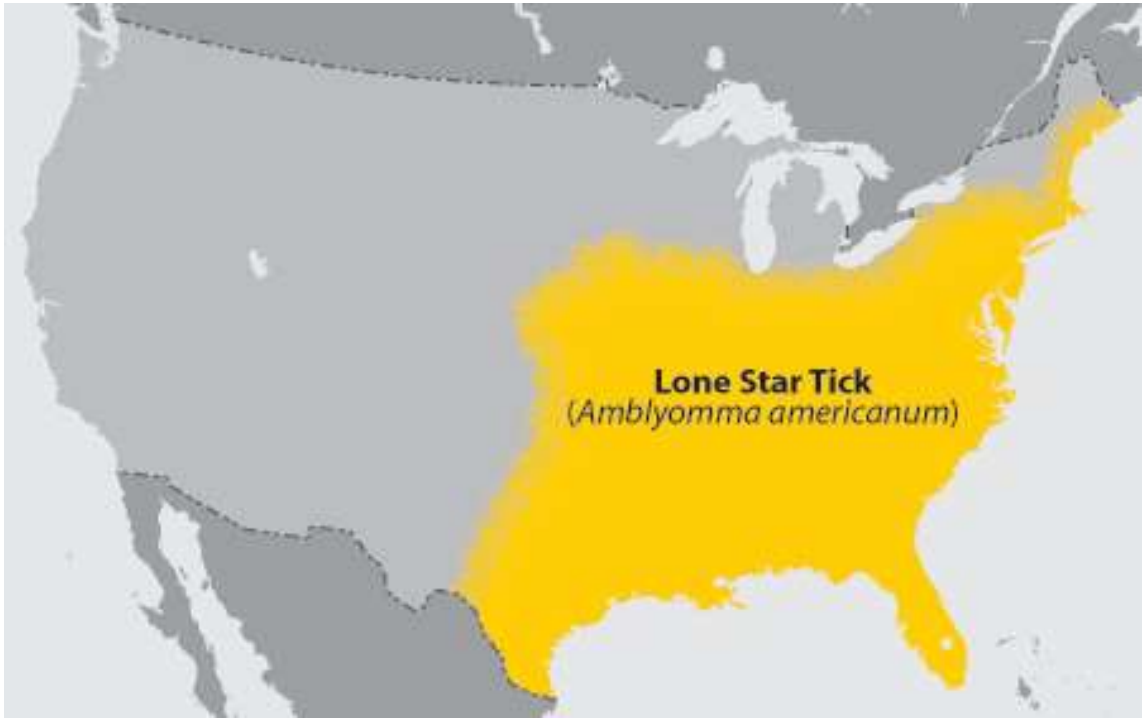
Lone Star Tick: Biology

- All stages found throughout warm months
- Found in shady locations along roadsides, in meadows, grassy & shrubby habitats
- Prefers low growing vegetation
- Larval ticks (seed ticks) congregate in large numbers on vegetation

Lone Star Tick: Diseases

- Carries ehrlichiosis & southern tick-associated rash illness (STARI)
- May also transmit tularemia
- Infected tick attached to host several hours before transmitting disease

Lone Star Tick – Distribution

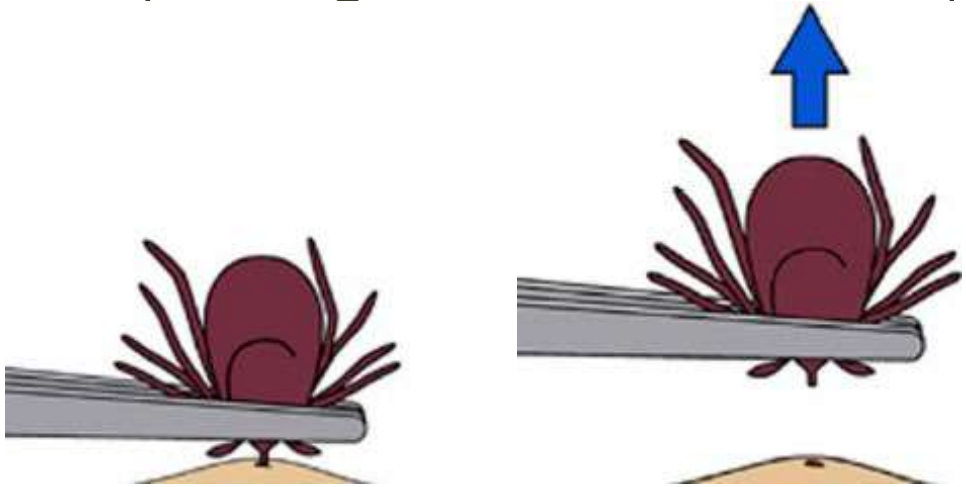


Tick Removal

- Remove tick ASAP
- Do not crush, squeeze, or puncture tick
- Avoid touching tick with bare hands
- Using needle-nose tweezers grasp tick as close to skin as possible
- Use steady pressure & pull straight out
- After removal, disinfect bite & wash hands

Tick Removal

- Do not use a hot match or cigarette
- Do not apply solvents or other materials
- Do not twist or jerk the tick
- Do not try to dig out broken mouthparts



Disease Transmission

- Tick injects saliva through mouthparts while feeding
- Saliva may contain disease causing bacteria – not all ticks are infected
- Feeding is delayed until tick is able to penetrate skin
- Removal of tick before feeding begins prevents transmission of disease

In Case of Tick Bite

- If tick is imbedded, follow tick removal procedure
- Save tick for identification
- Record date of tick bite
- See your doctor if symptoms develop, & report tick exposure to doctor

Rocky Mountain Spotted Fever (RMSF)

- Symptoms appear in 3 to 12 days - sudden high fever, headache, & aching muscles
- Non-itchy rash may develop on wrists & ankles during 2nd or 3rd day of fever, then spread to other parts of body
- Rapidly progresses - causes death in 25% of cases if not treated with antibiotics

RMSF Rash

Tick Paralysis

- Results from neurotoxin in tick saliva
- Symptoms start within 2-7 days, beginning with weakness in both legs progressing to paralysis
- Paralysis ascends within hours – may lead to respiratory failure & death
- Treatment – removal of embedded tick

Lyme Disease

- Early symptoms - expanding bull's-eye rash at site of tick bite within 3-30 days in 70-80% of cases, also fatigue, chills, fever, headache, muscle & joint aches, swollen lymph nodes
- Immediate antibiotic therapy required
- If untreated may cause other lesions, facial palsy, meningitis, shooting pains, heart palpitations, dizziness, pain & swelling in large joints days or weeks after tick bite
- 60% of patients may have intermittent bouts of arthritis & 5% develop chronic neurological complaints months to years after tick bite

Bull's-eye Rash

Anaplasmosis & Erlichiosis

- Symptoms may begin 3 weeks after tick bite
- Initial symptoms may include fever, headache, & muscle pains
- Other symptoms may include nausea, joint pain, chills, confusion, & a rash
- May cause severe illness, especially if untreated – treated with antibiotics
- 50% of infected people require hospitalization

Southern Tick-Associated Rash Illness (STARI)

- Symptoms - red, expanding rash around site of bite; may experience fatigue, headache, fever, & muscle pains
- Rash usually appears within 7 days & expands to diameter of 3 inches or more
- Treatment - antibiotics

STARI Rash

Tularemia

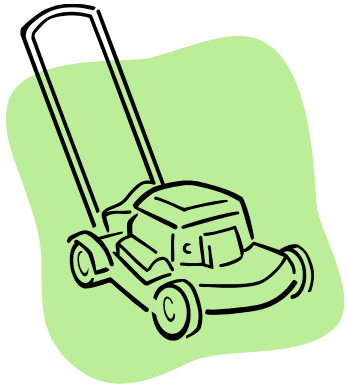
- Skin ulcer appears where bite has occurred
- Ulcer is accompanied by swelling of lymph glands in region of bite
- Pneumonic tularemia can occur if left untreated - bacteria spreads to lungs
- Treatment - antibiotics

Tularemia Ulcer

Preventing Tick Bites

- Use repellants with DEET (at least 25%)
- Avoid tick infested areas
- Tuck pants into sock tops or boots
- Wear light-colored clothing so ticks can be seen
- Check yourself, children, & pets frequently
- Bathe after exposure to tick habitat

Tick Control



- Mow lawn frequently
- Control brush & trim shrubs
- Fence yard to exclude animals
- Eliminate plants that attract wildlife
- Remove uneaten pet food from yard to avoid attracting wildlife
- Control pets, & treat pets for ticks
- Check pet bedding frequently, & wash or change bedding regularly

Tick Control Measures Required in Clermont County

- Grass cutting only, & only in developed residential areas – not required if lot is inaccessible to public (fenced)
- Grass must be cut from May 1st to October 1st if over 2' in overall height
- Orders to cut grass sent if written complaint is received & violation found

Websites with Additional Tick Information

- www.cdc.gov
- www.odh.gov
- www.clermonthealthdistrict.org
- www.ohioline.osu.edu
- www.extension.iastate.edu

Can you identify these ticks, and the diseases they carry?