Slide 1

Amblyomma hebraeum

Bont Tick
South Africa Bont Tick

Amblyomma hebraeum is a hard tick that infests livestock and wildlife. It also bites humans. The long mouthparts of *Amblyomma* ticks make them difficult to remove manually; these ticks also leave large wounds that may become infected by bacteria or infested by screwworms. *A. hebraeum* can transmit *Ehrlichia ruminantium* (formerly *Cowdria ruminantium*), the agent of heartwater. This tick also carries *Rickettsia africa*e, the agent of African tick-bite fever, an emerging zoonosis in rural sub-Saharan Africa and the Caribbean.

Slide 2

Overview

- Organism
- Identification
- Importance
- Geographic Distribution
- Life Cycle
- Associated Diseases
- Prevention and Control
- Recommended Actions

In today's presentation we will cover information regarding the tick *Amblyomma hebraeum* and the diseases it can transmit. We will also talk about how to identify the tick, and the impact this tick has had in the past and could have in the future. Additionally, we will talk about how it is transmitted and the species it affects. Finally, we will address prevention and control measures, as well as actions to take if *Amblyomma hebraeum* is suspected.

Slide 3

Organism

- *Amblyomma variegatum*
- Hard tick
  - Family Ixodidae
- Three-host tick
- Hosts
  - Small mammals, birds, reptiles
  - All domestic ruminant species
- Can feed on humans

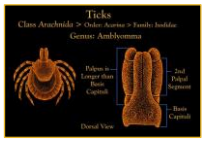
Amblyomma hebraeum is a hard tick in the family Ixodidae. It is a three-host tick. Immature ticks feed on small mammals, ground-feeding birds, reptiles and all domestic ruminant species. Adult ticks can be found on livestock and wildlife including antelope, and are usually located on the relatively hairless parts of the body. *A. hebraeum* can feed on humans.

[Image: *Amblyomma hebraeum*. Florida Department of Health.]

Slide 4

Identification

- Dorsal scutum
- Mouthparts protrude
- Festoons
- Size variation
  - Males: 4.2 – 5.7mm
  - Females: up to 20 mm when engorged
- Submit ticks for identification



Hard ticks have a dorsal shield (scutum) and their mouthparts (capitulum) protrude forward when they are seen from above. *Amblyomma* ticks are large variegated ticks with long, strong mouthparts. The palps are long; the second segment is twice as long as it is wide. Eyes are present and the festoons are well developed. The males have no adanal shields, accessory shields or subanal shield. *A. hebraeum* males are 4.2–5.7 mm long, oval ticks. The scutum is smooth and convex, with fine black or brown spots and stripes on a pale greenish-white background. The legs are dark brown, moderately stout, and have apical yellow banding at the distal end of each segment. Unfed *A. hebraeum* females are 5 mm long; engorged females can be up as long as 20 mm. The dorsum is dark greenish–brown or black, punctate and striate. Tick identification to the species level can be difficult, and ticks should be submitted to an expert for identification whenever possible.

[Image: This drawing depicts some of the anatomic characteristics displayed by ticks that are members of the genus *Amblyomma*. CDC Public Health Image Library.]

Slide 5

Importance

- Feeds on livestock, wildlife, and humans
- Painful bites result in large wounds
  - Secondary infection
  - Infestation (e.g., screwworm)
- Pathogens transmitted
  - *Ehrlichia ruminantium*
  - *Rickettsia africae*

Center for Food Security and Public Health, Iowa State University, 2011

Amblyomma hebraeum infests livestock and wildlife. It also bites humans. The long mouthparts of *Amblyomma* ticks make them difficult to remove manually; these ticks also leave large wounds that may become infected by bacteria or infested by screwworms. *A. hebraeum* can transmit *Ehrlichia ruminantium* (formerly *Cowdria ruminantium*), the agent of heartwater. This tick also carries *Rickettsia africae*, the agent of African tick-bite fever.

Slide 6

Geographic Distribution

- Tropics and subtropics
- Moderately humid, warm savannas
- Endemic
  - South Africa
  - Zimbabwe
  - Botswana
  - Namibia
  - Malawi, Angola
  - Mozambique

Center for Food Security and Public Health, Iowa State University, 2011

A. hebraeum is found in the tropics and subtropics. It prefers moderately humid, warm savannas. This tick is endemic in African countries including South Africa, Zimbabwe, Botswana, Namibia, Malawi, Mozambique and Angola.

[Image: Washington, D.C.: Central Intelligence Agency, 1997.]

Slide 7

Life Cycle

- Three-host tick
  - Adult ticks feed on third host
    - Drop to ground to lay eggs
    - Eggs hatch and become larvae
  - Larvae attach to first host
    - Leave first host and molt into nymphs
  - Nymphs attach to second host
    - Nymphs drop off and molt into adults
  - Adults attach to third host

Center for Food Security and Public Health, Iowa State University, 2011

A. variegatum is a three-host tick. These ticks can be found on the host for several days while they feed, then they drop to the ground. Adult ticks can be found on livestock and wildlife including antelope. Most are found on the ventral body surface, the perineum, and the axillae, as well as under the tail. Females lay eggs that become larvae. Larvae attach to the first host, then drop off and become nymphs. Nymphs attach to the second host. Later, the nymphs drop off and molt into adults. Immature ticks feed on small mammals, ground-feeding birds, reptiles and all domestic ruminant species.

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Associated Diseases

- *Ehrlichia ruminantium*
  - "Heartwater"
  - Mainly affects ruminants
  - Diarrhea, neurological signs, hydropericardium
- *Rickettsia africae*
  - Emerging zoonosis
  - Fever, nausea, headache, muscle pain
  - Eschar at bite site

Center for Food Security and Public Health, Iowa State University, 2011

Heartwater, a rickettsial disease of ruminants, is one of the most important diseases of livestock in Africa. This tick-borne illness can significantly decrease productivity in regions where it is endemic. The symptoms begin with a sudden fever, anorexia, listlessness and dyspnea. Some animals, particularly cattle, may also develop diarrhea. These symptoms are followed by neurological signs. Hydropericardium, with straw–colored to reddish pericardial fluid, gives heartwater its name. *Rickettsia africae* is the agent of African tick-bite fever, which is an emerging zoonosis in rural sub-Saharan Africa and the Caribbean; it causes fever, nausea, fatigue, headache, muscle pain, and neck stiffness. Eschars may occur at the bite site.

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Prevention and Control

- Exclude exotic ticks
  - Pre-export inspection of animals
  - Animals certified-free of ectoparasites
  - Quarantine upon entry
- Acaricide treatment
- Three-host ticks
  - Difficult to eradicate
  - Environmental control

Center for Food Security and Public Health, Iowa State University, 2011

Measures used to exclude exotic ticks from a country include pre-export inspection and certification that the animals are free of ectoparasites, quarantines upon entry, and treatment with acaricides. In countries where *A. hebraeum* is already present, acaricides can eliminate the ticks from the animal, but do not prevent reinfestation and must be repeated periodically. Three-host ticks spend at least 90% of their life cycle in the environment rather than on the host animal; ticks in the environment must also be controlled to prevent their spread. If ticks are already widespread in a region, eradication can be difficult. Eradication programs are based on animal identification and periodic acaricide treatment of livestock, as well as public education, surveillance, quarantines and movement restrictions.
[Image: Scott Bauer, USDA.]

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Recommended Actions

- IMMEDIATELY notify authorities
  - Federal
    - Area Veterinarian in Charge (AVIC) http://www.aphis.usda.gov/animal_health/area_offices/
  - State
    - State Animal Health Officials (SAHO) www.usaha.org/Portals/6/StateAnimalHealthOfficials.pdf
- Quarantine

If you suspect *A. hebraeum*, state or federal authorities should be notified immediately. Animals suspected infested with *A. hebraeum* should be isolated, and the farm should be quarantined until definitive diagnosis is determined.

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Additional Resources

- Center for Food Security and Public Health
  - www.cfsph.iastate.edu
- USAHA Foreign Animal Diseases ("The Gray Book")
  - www.aphis.usda.gov/emergency_response/downloads/nahems/fad.pdf
  -

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Acknowledgments

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