

Rhipicephalus appendiculatus

Brown Ear Tick

Last Updated: September 2009

Importance

Rhipicephalus appendiculatus is a hard tick found in the ears of cattle, other livestock, buffalo and antelope. This tick is considered to be a major pest in areas where it is endemic. Heavy infestations can cause anemia, severe damage to the ears, or a toxicosis that results in the loss of resistance to some tick-borne infections. More than a thousand ticks have been found on some animals. *R. appendiculatus* can transmit a number of pathogens including *Theileria parva* (East Coast fever), Nairobi sheep disease virus and Thogoto virus.

A closely related species, *Rhipicephalus zambeziensis*, which has similar feeding patterns and hosts, occurs in warmer, drier areas of Africa.

Species Affected

R. appendiculatus mainly infests cattle, buffalo and large antelope, but it can occur on other species including sheep and goats. Immature ticks may also be seen on small antelope, carnivores, hares and other species.

Geographic Distribution

R. appendiculatus prefers relatively cool, shaded, shrubby or woody savannas or woodlands with at least 24 inches of annual rainfall. This tick occurs in parts of eastern, central and southeastern Africa, and can be found from sea level to 7400 feet (2300 meters). Its distribution within this area is limited to suitable environments with appropriate hosts.

Life Cycle

R. appendiculatus 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 to develop to the next stage.

R. appendiculatus mainly infests cattle, buffalo and large antelope, but it can occur on other species including sheep and goats. Immature ticks may also be seen on small antelope, carnivores, hares and other species. Adult *R. appendiculatus* prefer to feed in the ears, but some are found on the head. Immature ticks feed in the ears, on the head, and on the legs.

In the subtropical central and southern regions of Africa, *R. appendiculatus* completes one life cycle, and the occurrence of adults, nymphs or larvae is seasonal, with most adult ticks found from mid-summer to late summer. In tropical areas, more than one life cycle can be completed each year, and all stages occur at one time. Up to three generations per year may be seen in areas with sufficient rainfall.

Identification

R. appendiculatus is a member of the family Ixodidae (hard ticks). Hard ticks have a dorsal shield (scutum) and their mouthparts (capitulum) protrude forward when they are seen from above.

Rhipicephalus spp. ticks are brown ticks with short palps. The basis capitulum is usually hexagonal and generally inornate. Eyes and festoons are both present and Coxa I is deeply cleft. The spiracular plates are comma-shaped. The males of this genus have adanal shields and usually have accessory shields.

Male *R. appendiculatus* are brownish, reddish-brown or very dark, with reddish-brown legs. They vary from 1.8 to 4.4 mm in length. The basis capitulum is variable; the lateral margins may be more or less angled. The scutal punctuations are scattered and of moderate size; they are evenly dispersed in the center, but few or none may be found beyond the lateral grooves and in the lateral fields. The cervical grooves are moderately reticulate or non-reticulate. The posteromedian and para-median grooves are narrow and distinct. The adanal shields are long and have slightly rounded angles, but can be somewhat variable. Coxa I has a distinctly pointed dorsal projection.

Female *R. appendiculatus* are also brown, reddish brown or very dark. The punctuations are small to moderate sized and are similar to those found in the male.



the Center for
Food Security
& Public Health

IOWA STATE UNIVERSITY®

College of Veterinary Medicine
Iowa State University
Ames, Iowa 50011
Phone: 515.294.7189
Fax: 515.294.8259
cfsph@iastate.edu
www.cfsph.iastate.edu



INSTITUTE FOR
INTERNATIONAL
COOPERATION IN
ANIMAL BIOLOGICS

Iowa State University
College of Veterinary Medicine
www.cfsph.iastate.edu/IICAB/

Rhipicephalus appendiculatus

The scutum is approximately equal in length and width; its posterior margin is slightly tapering or abruptly rounded. The lateral grooves are short, poorly defined or absent. The cervical grooves are long and shallow and almost reach the posterolateral margins.

Tick identification to the species level can be difficult, and ticks should be submitted to an expert for identification or confirmation. Ticks that are submitted in 70% ethanol can be examined morphologically, and if necessary, tested by PCR. Both male and female ticks, and ticks from different life stages, should be submitted if they can be found.

Recommended actions if *R. appendiculatus* is suspected

Notification of authorities

Known or suspected *R. appendiculatus* infestations should be reported immediately to state or federal authorities.

Federal: Area Veterinarians in Charge (AVIC):

www.aphis.usda.gov/animal_health/area_offices/

State Veterinarians:

www.usaha.org/Portals/6/StateAnimalHealthOfficials.pdf

Control Measures

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. Three-host ticks can be very difficult to eradicate once they have become established.

In endemic areas, acaricides can eliminate these ticks from the animal, but do not prevent reinfestation. Three-host ticks spend at least 90% of their life cycle in the environment rather than on the host animal; ticks must also be controlled in the environment to prevent their spread.

Public Health

R. appendiculatus can feed on humans.

Internet Resources

Acarology WWW Home Page

http://www.nhm.ac.uk/hosted_sites/acarology/

The Merck Veterinary Manual

<http://www.merckvetmanual.com/mvm/index.jsp>

The University of Edinburgh. The Tick Collection.

<http://www.nhc.ed.ac.uk/index.php?page=24.25.121>

Tick Identification Key from the University of Lincoln

<http://webpages.lincoln.ac.uk/fruedisue/FR-webpages/parasitology/Ticks/TIK/tick-key/index.htm>

United States Animal Health Association. Foreign Animal Diseases

http://www.aphis.usda.gov/emergency_response/downloads/naheems/fad.pdf

World Organization for Animal Health (OIE)

<http://www.oie.int>

OIE Terrestrial Animal Health Code

<http://www.oie.int/international-standard-setting/terrestrial-code/access-online/>

References

- Arthur DR. Ticks and disease. New York: Pergamon Press; 1961. Diagnosis of *Rhipicephalus appendiculatus*; p. 70-73.
- Kahn CM, Line S, editors. The Merck veterinary manual [online]. Whitehouse Station, NJ: Merck and Co; 2006. *Rhipicephalus* spp. Available at: <http://www.merckvetmanual.com/mvm/index.jsp?cfile=htm/bc/72115.htm>. Accessed 30 Sept 2009.
- Kettle DS. Medical and veterinary entomology. Tucson, AZ: CAB International; 1990. *Rhipicephalus appendiculatus*; p. 472-5.
- Kolonin GV. Fauna of Ixodid ticks of the world. Moscow; 2009. Genus *Rhipicephalus* Koch, 1844. Available at: <http://www.kolonin.org/17.html>. Accessed 30 Sept 2009.
- Little S. Arthropod livestock pests and disease vectors. In: Foreign animal diseases. 7th edition. Boca Raton, FL: United States Animal Health Association; 2008. p. 125-35.
- Madder M, Speybroeck N, Bilounga A, Helleputte D, Berkvens D. Survival of unfed *Rhipicephalus appendiculatus* and *Rhipicephalus zambeziensis* adults. Med Vet Entomol. 2005;19(3):245-50.
- Merial New Zealand. Sheep disease information [online]. Merial; 2001. Parasite profiles: Ticks. Available at: <http://nz.merial.com/farmers/sheep/disease/haema.html>. Accessed 11 Dec 2006.
- Mtambo J, Madder M, Van Bortel W, Berkvens D, Backeljau T. *Rhipicephalus appendiculatus* and *R. zambeziensis* (Acari: Ixodidae) from Zambia: a molecular reassessment of their species status and identification. Exp Appl Acarol. 2007;41(1-2):115-28.
- New South Wales Department of Agriculture. Identification of the paralysis tick *I. holocyclus* and related ticks [online]. New South Wales Department of Agriculture; 2001 Feb. Available at: <http://members.ozemail.com.au/~norbertf/identification.htm>. Accessed 29 November 2001.
- Walker JB, Keirans JE, Horak I. The genus *Rhipicephalus* (Acari, Ixodidae): a guide to the brown ticks of the world. Cambridge, NY: Cambridge University Press; 2000. *Rhipicephalus appendiculatus*; p. 59-71.
- Wilson DD, Bram RA. Foreign pests and vectors of arthropod-borne diseases. In: Foreign Animal Diseases. Richmond, VA: United States Animal Health Association; 1998. Available at: http://www.vet.uga.edu/vpp/gray_book02/fad/fpv.php. Accessed 11 Dec 2006.

*Link defunct as of 2009