

THE TICKS OF SOUTH DAKOTA: AN ANNOTATED CHECKLIST (ACARI: IXODOIDEA)^{1,2}

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ABSTRACT: Collection data are reported for 16 species of ticks from South Dakota. Nine species, *Argas cooleyi* Kohls & Hoogstraal, *Ornithodoros concanensis* Cooley & Kohls, *Otobius megnini* (Duges), *Dermacentor andersoni* Stiles, *Haemaphysalis chordeilis* (Packard), *H. leporispalustris* (Packard), *Ixodes eastoni* Keirans & Clifford, *I. kingi* Bishopp and *I. spinipalpis* Hadwen & Nuttall are restricted in distribution to the western portion of the state, west of the Missouri River. Six species, *Ornithodoros kelleyi* Cooley & Kohls, *Dermacentor albipictus* (Packard), *D. variabilis* (Say), *Ixodes sculptus* Neumann, *I. muris* Bishopp & Smith and *Rhipicephalus sanguineus* Latreille are more widely distributed, while *I. cookei* Packard is restricted in distribution to the eastern edge of the state.

Ticks have long been recognized as important transmitters of various disease agents to both man and animals. Saliba et al. (1966) described an outbreak of tularemia among native Americans on the Rosebud and Pine Ridge Indian Reservations of southwestern South Dakota that was associated with *Dermacentor variabilis*. Cases of Rocky Mountain spotted fever in man, associated with *D. variabilis*, regularly occur each year, more often in eastern South Dakota, and the virus of Colorado tick fever associated with *D. andersoni* is probably transmitted to man each year in the Black Hills of the western portion of the State. Powassan virus, a proven human disease agent, has been isolated from the blood of small mammals and ticks, *I. spinipalpis* and *D. andersoni* from Spearfish Canyon in the northern Black Hills (Keirans and Clifford 1983).

Non-human etiological agents of disease have also been isolated from ticks in this state. Several isolations of the soft tick viruses Sapphire II and Six Gun City have been recovered from *Argas cooleyi* collected from the Badlands and the Wind Cave National Parks of southwestern South Dakota (C.E. Yunker, pers. comm.).

The relationship to disease of these 16 species of ticks and their distribution, as provided in this list, will become more important as this geographical area is shared with an ever expanding tourist population. Currently many vacationers from the 50 United States as well as the

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provinces of Canada find the Black Hills area and the Badlands National Park pleasant areas to visit. Unless otherwise indicated by the name of the collector, the tick records included here were made by the author and most are on file at the Rocky Mountain Laboratories (USPHS), Hamilton, Montana. Entomologists and other persons concerned with ticks should be advised that the RML tick collection was transferred to The Smithsonian Institutions's new facility at Silver Hill, Maryland in August of 1983 (J.E. Keirans, pers. comm.).

Family Argasidae Canestrini

Genus *Argas* Latreille

Argas cooleyi Kohls & Hoogstraal, Ex. nesting sites of cliff swallows, *Petrochelidon pyrrhonota* from the following locations: on face of cliff, 20 Aug. 1977, Wind Cave Canyon, Wind Cave Nat'l Pk., Custer Co.; nesting sites under small bridge, 24 Aug. 1977, Badland Nat'l Pk. n. of Interior, Jackson, Co.; nests in metal road culvert, 30 June 1980, e. side of Cuny Table near Rockford in Northern Shannon Co.; 19 July 1980, 18 mi se. of Scenic, Pennington Co.

First published record in state was by Wilson (1978) from *P. pyrrhonota* nesting sites in a road culvert near Wanblee on the Pine Ridge Indian Reserv., Washabaugh Co.

Genus *Ornithodoros* C.L. Koch

Ornithodoros concanensis Cooley & Kohls. Ex. nesting site of *P. pyrrhonota* on face of cliff, 20 Aug. 1977, Wind Cave Canyon in Wind Cave Nat'l Pk., Custer Co.; ex. imm. prairie falcons *Falco mexicanus*, 24-25 June 1967, western South Dakota J. Flavin (RML 47651); ex. woman, Aug. 1967. Ft. Pierre, Stanley Co. B. Diamond (RML 48622).

First published record by Wilson (1978) was from cliff swallow nests near Wanblee, Washabaugh Co.

Ornithodoros kelleyi, Cooley & Kohls. Ex. *Myotis lucifugus carissima*, 29 May 1968, Harding Co., J.K. Jones, Jr. (RML 50369); ex. *Myotis s. subulatus*, 20 June 1947, 2 mi. se Wall, Pennington Co., M.L. Johnson (RML 24329); ex. *Myotis lucifugus* in school, Sept. 1979, Mission, Todd Co. (RML 109699).

First published record of this species by Anderson and Jones, Jr. (1971) was from a barn at Ralph in eastern Harding Co.

Genus *Otobius* Banks

Otobius megnini (Duges). Cooley and Kohls (1944) reported the spinose ear tick from the ears of cattle in Haakon and Fall River Counties.

The lack of recent record of *O. megnini* from South Dakota as well as the permanent establishment of the parasite in neighboring states suggests that previous records probably resulted from interstate movement of livestock.

Family Ixodidae Murray

Genus *Dermacentor* Koch

Dermacentor albipictus (Packard). Ex. mountain goat, *Oreamnos americanus*, 22 November 1951, Custer State Park, Custer Co., collector unknown, (RML 30033); ex. elk, *Cervus*

canadensis, 25 Jan. 1924, Wind Cave Nat'l Pk., Custer Co., collector unknown, (RML 60433); ex. drag, 13 June 1962, Spearfish Canyon, Lawrence Co., R. Kennedy; (RML 38013); ex. beneath bale of hay, 4 May 1980, Redig, Harding Co.; ex. cattle, 8 Dec. 1982, Tyndall, Bon Homme Co.

Bishopp and Trembley (1945) first reported this tick from South Dakota, but hosts were not listed. Boddicker and Huggins (1969) found *D. albipictus* on mule deer, *Odocoileus hemionus* in the Slim Buttes area of Harding Co. and the record from Bon Homme Co. listed above is the first reported occurrence of this species in eastern South Dakota.

Dermacentor andersoni Stiles. Ex. woman, August 1950, Newell, Butte Co., collector unknown, (RML 27865); ex. drag, 18 May 1955, Wind Cave Nat'l Pk. campground, Custer Co. (RML 33268); ex. drag 13 May 1955, 1 mi. w. headquarters, Custer State Pk., Custer Co., Kohls and Jellison, (RML 33260); ex. drag, 14 June 1978, Hells Canyon, Jewell Cave Nat'l Mon., Custer Co.; in sheep pens, 16 May 1955, 12 mi. w. of Edgemont, Fall River Co. (RML 33264); ex. *Eutamias minimus pallidus*, 15 May 1968, 2 mi. s. 3 1/4 mi. from Reva, Harding Co., J.K. Jones, Jr. (RML 50367); ex. drag, 13 June 1978, 12 mi. s. of Reva. Custer Nat. For., Harding Co.; ex. drag, 28 May 1963, near Interior, Jackson Co., J. Bell and G.M. Kohls (RML 38798); ex. drag, 2 May 1982, Spearfish Canyon, Lawrence Co. (RML 115987); ex. drag, 2 May 1980, Bear Butte State Pk., Meade Co.; ex. man, 11 April 1948, Rapid City, Pennington Co., collector unknown (RML 25337); ex. drag, 3 May 1982, Pine Ridge Indian Reservation, Shannon Co. (RML 115990).

Dermacentor variabilis (Say). Ex. drag, 24 May 1977, Oak Lane Girl Scout Camp, 7 mi. s. of Astoria, Brookings Co. (RML 105144); ex. drag, 3 June 1963, Belle Fourche River between Newell and Belle Fourche, Butte Co., G.M. Kohls and J. Bell; ex. drag, 8 May 1981, Bailey's Lake 9 mi. n. of Clark, Clark Co.; ex. drag, 10 May 1977, 2 1/2 mi. NE Watertown, Codington Co.; ex. drag, 20 June 1981, Mitchell, along Big Sioux River, Davison Co.; ex. dog, 22 July 1957, Enemy Swim District, Day Co. (RML 34616); ex. drag, 1 June 1979, 2 miles northwest of Gary, Deuel Co., Kieckhefer and Swartos (RML 109474); ex. drag, 18 May 1955, 11 mi. NW Oelrichs, Fall River Co., G.M. Kohls and W.L. Jellison (RML 33269); ex. drag, 15 May 1980, Damerow road side park, 4 mi. s. of Milbank, Grant Co.; ex. coyote, *Canis latrans*, 5 May 1977, 3 miles northwest of Lucas, Gregory Co., E. Sheldon; ex. drag, 10 May 1977, Lake Poinsett State Pk., Hamlin Co.; ex. drag, 23 May 1979, St. Lawrence Natural Pk., St. Lawrence, Hand Co.; ex. drag, 30 April 1982, Farm Island State Pk., SE of Pierre, Hughes Co., (RML 115992); ex. drag 31 May 1977, Cottonwood Range and Livestock Research Station, 2 mi. E. of Cottonwood, Jackson Co.; ex. drag, 13 May 1980, Lake Whitewood s. of Lake Preston, Kingsbury Co.; ex. *Erethizon dorsatum*, 25 May 1979, Whitewood, Lawrence Co., (RML 109470); ex. drag, 3 June 1978, Newton Hills State Pk., 5 mi. s. of Canton, Lincoln Co.; ex. drag, 21 May 1977, Sica Hollow State Pk., 16 mi. NW of Sisseton, Marshall Co. (RML 105143); ex. drag, 10 July 1979, Bear Butte State Pk., 9 mi. n. of Sturgis, Meade Co. (RML 109490); ex. dog, 2 May 1972, 5 mi. n. of Colman, Moody Co.; ex. man, 28 April 1937, Rapid City, Pennington Co., R.J. Jackson (RML 13167); ex. drag, 30 June 1978, Shadehill Reservoir, Perkins Co.; ex. drag, 20 May 1979, Hartford Beach State Pk., Roberts Co. (RML 109462); ex. drag, 30 April 1982, Pine Ridge Indian Reservation, Shannon Co., J. Casken and E.R. Easton (RML 115989); ex. porcupine, *Erethizon dorsatum*, 9 July 1979, 17 miles n. Midland, Stanley Co., (RML 109491); ex. dog, 3 May 1982, Rosebud Indian Reservation, Todd Co., R. Ballinger (RML 115991); ex. drag, 12 May 1979, Union County State Park, 11 mi. s. of Beresford, Union Co., (RML 109460); ex. drag, 24 May 1977, 12 miles ne Dupree, Ziebach Co., G.M. Kohls and J. Bell.

Saliba et al. (1966) reported this species from Todd and Shannon Counties in the western part of the state, but Ulrich and Vaughn (1963) were first to report it from Clay County in southeastern South Dakota.

Genus *Haemaphysalis* Koch

Haemaphysalis chordeilis (Packard). Boddicker and Huggins (1965) collected this tick from sharptailed grouse, *Pedioecetes phasinaellus*, in either Haakon, Jackson, Mellette or Washabaugh Co. of WC South Dakota.

Haemaphysalis leporispalustris (Packard). Ex. *Sylvilagus audubonii*, 6 Aug. 1980, Martin, Bennett Co., (B. Baran & E.R. Easton); ex. *Sylvilagus floridanus*, 30 May 1980, Spearfish Canyon, s. of Spearfish, Lawrence Co., (E.R. Easton, C.M. Clifford and J.E. Keirans).

Even though Bishopp and Trembley (1945: Fig. 11) show *H. leporispalustris* as occurring nationwide, their collections at that time did not contain material from South Dakota. Turner (1974) evidently was first to report this species from *S. auduboni* near Minnekahta in Fall River Co. Thus far, I have been unable to find the rabbit tick in South Dakota east of the Missouri River.

Genus *Ixodes* Latreille

Ixodes cookei Packard. The only record of this tick available to me is from Banks (1908), who reported *I. cookei* from a small mammal (possibly a woodchuck) from Brookings, Brookings Co.

Ixodes eastoni Keirans & Clifford. Reported originally by Keirans and Clifford (1983) from rodents and insectivores from Lawrence and Pennington Counties of the northern Black Hills as well as from Harding Co., in the northwestern part of the state.

Ixodes kingi Bishopp. Ex. red fox, *vulpes vulpes*, 19 May 1978, 16 Mi. e. of Chamberlain, Brule Co., C. Emmett; ex. *Peromyscus maniculatus*, 17 June 1967, Fall River Co., J.K. Jones, Jr. (RML 48986); ex. *C. latrans*, 12 October 1976, Harding Co., (L. Sheldon); ex. *Mustela frenata*, 29 July 1972, e. of Cottonwood, Jackson Co. (RML 64200); ex. *Mustela nigripes*, 23 Oct. 1952, Zeona, 4 mi. n. of Moreau River, Perkins Co. (RML 64214); ex. swift fox, *Vulpes velox*, June-Aug. 1978, 14 mi. n. of Ogalala, Shannon Co., J. Sharp.

First reported by Boddicker (1968) from *M. nigripes* in Mellette Co.

Ixodes muris Bishopp & Smith. Ex. *Zapus hudsonius pallidus*, 8 July 1967, LaCreek National Wildlife Ref., 4 mi. s. 8 mi. e., Martin, Bennett Co., J.K. Jones, Jr. (RML 48988); ex. *Microtus p. pennsylvanicus*, 18 June 1965, Hartford Beach State Pk., Roberts Co., J.K. Jones, Jr. (RML 46415).

First reported in this state by Keirans and Clifford (1978) without additional data.

Ixodes sculptus Neumann. Ex. *Spermophilus tridecemlineatus*, 27 July 1968, Custer Co. J.K. Jones, Jr. (RML 53745); ex. *Cynomys ludovicianus*, April-June 1977, Wind Cave Nat'l Pkg., Custer Co., (J. Hoogland); ex. *S. tridecemlineatus*, 24 March 1977, Buffalo, Harding Co.; ex. *Canis latrans*, 11 Sept. 1976, Harding Co.; ex. longtail weasel *M. frenata*, June 1977, 7 mi. w. of Highmore, Hyde Co.; ex. *S. tridecemlineatus*, 24 July 1972, se of Cottonwood, Jackson Co. (RML 64256).

Cooley and Kohls (1945) record this tick from *S. tridecemlineatus* in Brookings Co., but the earliest report was apparently by Bishopp (1911) (RML 66141).

Ixodes spinipalpis Hadwen & Nuttall. Ex. *Neotoma cinerea*, 26 July 1967, 2 mi. s., 10 mi. w. of Lead, Lawrence Co., J.K. Jones, Jr. (RML 48989); ex. *N. cinerea*, 14 Aug. 1979, Spearfish Canyon, Lawrence Co.; ex. *Peromyscus maniculatus*, 27 Aug. 1968, Wind Cave Canyon, Wind Cave Nat'l Pk., Custer Co., J.K. Jones, Jr. (RML 53746); ex. *P. maniculatus*, 4 Sept. 1983, 1 mi. n., 5 1/2 mi. e. of Hot Springs. Fall River Co., J.K. Jones, Jr. (RML 53768).

McLean et al. (1964) mentioned isolations of Powassan virus from *I. spinipalpis* collected from *Peromyscus* mice in Spearfish Canyon in Lawrence Co.

Genus *Rhipicephalus* Koch

Rhipicephalus sanguineus (Latreille). Ex. dog in home, 21 Apr. 1980, Huron, Beadle Co.

Nelson (1966) was first to report this species in South Dakota on a map of record nationwide. Later Nelson (1968) listed a single record from Madison, Lake Co., according to a U.S. Dept. of Agriculture collection dated 21 April 1962. The lack of additional records of this species in South Dakota indicates that *R. sanguineus* not only cannot overwinter out-of-doors at this latitude, but ticks would have to be accidentally introduced during the short summer season through the movements of pet animals for tick multiplication to occur.

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